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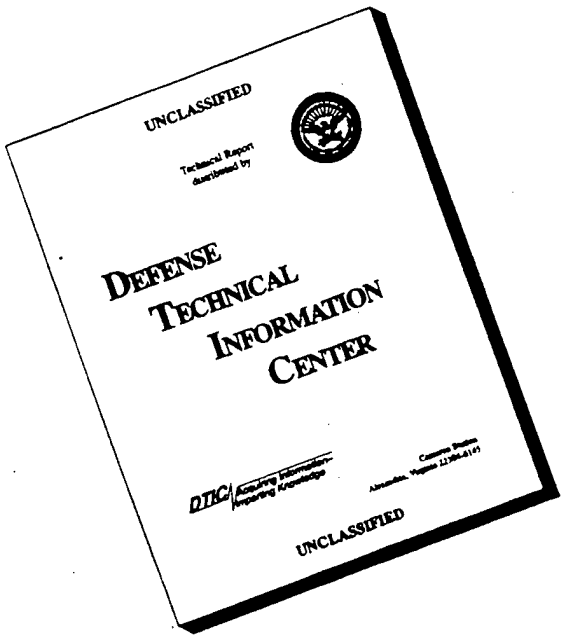

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History of

FLIGHT SUPPORT

HOLLOMAN AIR DEVELOPMENT CENTER

1946-1957

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HISTORY

of

FLIGHT SUPPORT

HOLLOMAN AIR DEVELOPMENT CENTER

1946 - 1957

HISTORICAL BRANCH
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AIR RESEARCH AND DEVELOPMENT COMMAND
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EDITORIAL NOTE

The History of Flight Support, Holloman Air Development Center, 1946-1957, by Dr. David Bushnell of the Center Historical Office, carefully examines from many approaches a complex and constant problem. A glance at the sources used for this study will indicate that Dr. Bushnell has brought to bear upon various aspects of the subject a wealth of documentary materials and the considered opinions of many persons active in providing flight support for the multitude of Air Force, Army and Navy research and development projects which use the vast Holloman-White Sands test range.

This history, also published as Book I of the first volume of History of Holloman Air Development Center, 1 July - 31 December 1956, has been issued under separate cover to make possible a wider distribution than permitted the full series of volumes concerning the broad history of Holloman Air Development Center.

JAMES STEPHEN HANRAHAN
Center Historian

FOREWORD

No detailed justification should be needed for a history of air support operations at Holloman Air Development Center. Since most actual development work in guided missiles and related fields is carried on by private contractor companies, air support is perhaps the most important single commodity provided by the Center from its own resources. In addition, air support has been a "problem area" during recent years; its real and alleged deficiencies have been a topic of controversy, and it is thus all the more advisable to bring the relevant facts together in accessible and accurate form.

However, the preparation of this study has presented certain special problems. Much of the available technical data on flight support of missile-testing is highly technical; and, whether technical or not, there is far more available on some phases of the problem than on others, and far more on the last two years than on the previous background. Then, too, as in all monographs of this nature, it has been hard to strike a balance between the wealth of illustrative detail that can give a study its future value as a reference and the brevity without

which few operating officials can be expected to skim even hastily through its pages.

Individual readers and using agencies must decide for themselves whether these problems have been resolved successfully. First of all, however, it is necessary to acknowledge the invaluable help that has been received from Army, Navy, and Air Force officers, civil service employees, and contractor officials in preparing this volume. The final responsibility for facts and judgments presented remains with the Historical Branch, but factual data and interpretive comments obtained through interviewing have been liberally used along with the standard documentary sources. So many individuals have been questioned regarding different aspects of the air support story, in fact, that it is literally impossible to list and thank every one within the scope of this Foreword.

One group must be singled out for special appreciation: Major John J. Anderson, Chief of the Operations Division of the Deputy Chief of Staff for Operations, and all the officers and secretaries who serve in his division. Because in its functions it touches upon a broader array of air support problems than any other single agency at Holloman, the members of this division have been subjected to questioning and their file cabinets searched at all hours of the working day. Specifically, valuable data has been received from all the

following officials, in addition to Major Anderson himself: Captain Jack H. Patterson, who has served in the Operations Division first as Flying Safety Officer and more recently as Aircraft Allocations Officer; Captain Jacob J. Quintis, Chief of the Operations and Training Branch; Captain Kenneth E. Harman, currently Flying Safety Officer; Mr. William A. Stevens, who was Aircraft Allocations Officer before Captain Patterson; and Mr. E. A. Weston, Assistant Aircraft Allocations Officer.

Assistance has been received at Center staff level from Colonel Gregorio P. Martinez, Jr., Deputy Chief of Staff for Materiel; Lieutenant Colonel Ulysses W. Hess, Deputy Chief of Staff for Personnel; Lieutenant Colonel William F. Haizlip, Inspector General; Captain Arthur G. Miller, Staff Maintenance Officer; and Major Charles LaBarr, Director of Procurement.

Various officials of the 6580th Air Base Group have also provided information when requested. Among these are Colonel Thomas C. Kelly, Base Commander; Lieutenant Colonel Oakley W. Baron, Chief, Flight Test Division; Major Mahlon A. Steiner, Chief, Flight Test Operations Branch; Major Hubert S. Williams, Commander of the 6580th Field Maintenance Squadron; Captain Robert L. Hardie, Accountable Supply Officer, 6580th Supply Squadron; Major Freddy L. Steadman, Maintenance Control Officer; Mr. John E. Tillotson, Assistant Maintenance Control Officer;

Chief Warrant Officer Joseph W. Rynkiewicz, Aircraft Maintenance Officer.

Both Air Force and contractor officials in Holloman's restricted "West Area" have supplied data and comments within their own technical specialties. In the Directorate of Aircraft Missile Test, help has been received from Lieutenant Colonel Theodore B. Swanson, Deputy Director; Major Archer W. Kinny, Jr., Assistant Deputy Director; Major Kenneth A. MacAaron, Chief, Operations and Plans Division; Captain Harley L. Grimm, Chief, F-101 Branch; Captain Norbert D. LaVally, Chief of Technical Evaluation, Air Defense Missile Branch; Mr. A. F. LaPierre, Assistant Chief, Missile Countermeasures Division; and Mr. William T. Fisher, Electrical Engineer, Drone Systems Test Branch. Elsewhere in the West Area, the following have supplied information: Major William M. Stowell (United States Army), Chief, Range Instrumentation Development Division, Integrated Range Mission; Dr. Anthony J. Wilk, Chief, Multisystems Application Branch, within the same division; Mr. Eugene E. Crowther, Test Director, Lockheed Aircraft Corporation; Mr. Edward E. Rich, Optical Physicist, Hughes Research and Development Laboratories, and other Hughes Aircraft Company personnel; and Mr. Lawrence V. Overell, Contract Specialist, Alamogordo Air Procurement Office.

Still other Holloman officials to whom acknowledgment is

due include Colonel John P. Stapp, Chief, and Captain Druey P. Parks, Administrative Officer, Aero Medical Field Laboratory; Major David G. Simons, Chief, Space Biology Branch; Captain Grover J. Schack, project officer for sub-gravity studies; Major John C. May, Chief, and Mr. James O. Rogers, Assistant Chief, Manpower and Organization Division, Deputy Chief of Staff for Operations; Mr. Harry Clifford, who also served until recently in that division; Commander Elton W. Bode, Naval Liaison Officer; Mr. Gerald E. Hanson, Administrative Officer in the Office of Deputy Chief of Staff for Materiel; and Mr. John W. Carter, Chief, Management Analysis Division, Deputy Chief of Staff for Comptroller.

Two tenant organizations at Holloman, the 3225th Drone Squadron and Detachment 3 of the United States Army Garrison at White Sands Proving Ground, have also proved extremely helpful. In the Drone Squadron thanks are due principally to Lieutenant Colonel Dean D. Conard, Commander; Major William W. Gray, Jr.; Captain Allan H. Hoover, Captain Milton R. Roberts; Lieutenant James M. Shoemaker; and Master Sergeant Fuller. In Detachment 3 acknowledgements are due above all to Captain Robert L. Hurd, Chief, Army Aviation Branch.

Full cooperation has also been received from officials of all three services at White Sands Proving Ground, notably including Lieutenant Colonel Wilbur D. Pritchard, Deputy for

Air Force, Integrated Range Mission; Mr. F. D. Moore, Range Facilities Control Officer; Mr. Samuel R. Cooper, Chief, Scheduling Section, Systems Test Division, WSPG; Commander T. C. Buell, Executive Officer, and Mr. G. Harry Stine, General Engineer, Naval Ordnance Missile Test Facility.

One more officer must be mentioned here since he answered numerous questions by mail and in person on topics entirely outside the scope of the duties he was fulfilling at the time: Colonel William H. Baynes, former Commander of Holloman Air Force Base, and only recently retired as Deputy for Missiles, Directorate of Systems Management, Air Research and Development Command Detachment 1. This still does not complete the list of persons who have helped in the gathering of data for the present volume. However, of those who cannot be included here, a few more (though admittedly not all) will be duly cited in the footnote references. In every case, once again, the Historical Branch wishes to express its appreciation for assistance rendered.

CHRONOLOGY

	1942	Alamogordo Army Air Base is established as a bomber training base.
	1945	White Sands Proving Ground is established, by the United States Army, on a section of the Tularosa Basin adjoining the bombing range of Alamogordo Army Air Field. German V-2 components are obtained for use in rocket experimentation at White Sands.
February	1946	Alamogordo Army Air Field placed on a stand-by basis, following the completion of its wartime training mission.
10 April	1946	After brief period of inactivation, Alamogordo Army Air Field is reactivated. It is assigned a new training mission, as well as a role in support of rocket experimentation at White Sands.
16 March	1947	Air Materiel Command shifts the Air Force guided missile program at Wendover Field, Utah, to Alamogordo Army Air Field.
18 September	1948	Ceremony changing the name of Alamogordo Army Air Field to Holloman Air Force Base. Original authorization for the change of name was in a Department of the Air Force Official Order dated 13 January 1948.
9 March	1949	Department of the Air Force transfers operational control of Air Force activities at Condron Field, White Sands Proving Ground, from Biggs Air Force Base to Holloman. However, Condron Field remains an Army installation (until the integration of the ranges in 1952), and Biggs continues to provide some air support to White Sands projects (also until the integration of the ranges).

	September	1951	A drone detachment from Air Proving Ground Command comes to Holloman Air Force Base to support both Holloman and White Sands testing. It is the forerunner of the present 3225th Drone Squadron.
1	September	1952	Holloman and White Sands ranges consolidated. Ordered by the Department of Defense in the interests of economy and to provide an integrated range for the development and testing of guided missiles.
22	September	1952	General Order 30, issued at White Sands Proving Ground, establishes rules for operation of the integrated range and assigns to the Air Force (Holloman) primary responsibility for all air support needed on the range by any of the three services.
	October	1952	Detachment 3 of 9393rd Technical Services Unit (now United States Army Garrison, White Sands Proving Ground) comes to Holloman to provide missile recovery service for all users of the range.
10	October	1952	Holloman Air Development Center established as command organization at Holloman Air Force Base, replacing the 6580th Missile Test Wing.
1	December	1952	Joint Use Agreement signed between Holloman Air Development Center and naval drone detachment. The latter becomes active about 1 January 1953 and continues service at Holloman until June 1955.
		1954	Fighter chase operations converted entirely to jet aircraft.
		1955	First F-100 aircraft assigned to Holloman, to become (ultimately) the basic chase type. Early F-100 operations brought a severe rash of maintenance and other difficulties.
	February	1955	Center reorganization establishes, in general, the present arrangement of air support functions. Flight operations

			(non-test as well as test) are entrusted to the Flight Test Division, while both organizational and field maintenance are assigned to the 6580th Field Maintenance Squadron.
	Spring	1955	Completion of first major improvements on Holloman runways since World War II. Two runways were lengthened to over 12,000 feet.
		1956	Holloman has an accident rate of 62.3 per 100,000 flying hours, the worst in Air Research and Development Command.
13	July	1956	Daily instead of weekly mission scheduling instituted on the integrated range, in order to cope with increased scale of operations.
	August	1956	Holloman aircraft in-commission rate sinks to 36.2 for test support and 24.1 for non-test aircraft.
1	August	1956	Eleven base-assigned aircraft placed in temporary storage for lack of maintenance capability.
1	September	1956	Lt. Col. William F. Haizlip, Holloman's Inspector General, takes command of the 6580th Field Maintenance Squadron with the special purpose of carrying out a general squadron reorganization. The latter continues after he leaves the command (2 January 1957) and contributes to a steady improvement in the maintenance situation.
1	November	1956	Urged by Headquarters, Air Research and Development Command, Holloman requests authority to contract with a private firm for aircraft maintenance.
20	December	1956	Flying Safety Office, after numerous organizational and physical moves, is attached for administrative purposes to the Deputy Chief of Staff for Operations. The incumbent is assured direct access

to the Deputy Center Commander.

21	January	1957	Plane belonging to the Army recovery service is caught in a telephone wire, thus ending a sixteen-month perfect flying safety record for Army aviation at Holloman.
	May	1957	1377 hours flown by base-assigned aircraft, setting new record for a single month.
	June	1957	One accident during the month spoils the Center's flying safety record for 1957, which had been perfect so far. Some consolation could be found in the fact that in-commission time for test support aircraft during June reached 81.0 per cent.

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of

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HOLLOMAN AIR DEVELOPMENT CENTER

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CHAPTER I

THE FOUNDATIONS OF HOLLOMAN AIR SUPPORT: 1946-52

In the second half of 1956 air support became a major topic of conversation, correspondence, and staff studies at Holloman Air Development Center. Its deficiencies were dramatized on 1 August when eleven planes were put temporarily in storage for lack of a maintenance capability,[1] and though the problems associated with this one aspect of the Holloman mission--shortage of qualified maintenance people, multiplicity of aircraft types, difficulties of coordination between scheduling and related functions--were by no means new, they seemed all at once to have reached a more critical stage. The chief immediate cause of this development was the growing scale of operations on the Holloman-White Sands Integrated Range, which in 1956 for the first time became literally "saturated" with research and development missions. Most features of the air support problem, however, had their precedents in the early days of missile-testing in the Tularosa Basin starting ten years before.

The one time when flight operations loomed largest had been World War II, when Holloman, then known as Alamogordo Army Air Field, was a training center for heavy bombardment crews. A training program, however, presented somewhat different problems from the later support of missile-testing, and in any case

it came to an abrupt halt when war ended. At the start of 1946 the base was briefly put on inactive status, the remaining B-29's were ferried out to Ogden, Utah, and exactly one aircraft was left assigned: a humble C-45 to be used for local proficiency and administrative flights. This one plane, with base commander Colonel Kermit D. Stevens at the controls, was wrecked on a routine flight in July 1946 when a B-17 taxied into it. Fortunately, a replacement was soon provided so that Alamogordo Army Air Field was left only temporarily with no assigned aircraft to fly at all.[2]

Although the scarcity of base-assigned planes continued for some time, the use of Alamogordo Army Air Field by outside organizations caused the tempo of flight operations to increase once again in the spring of 1946. For one thing, starting in April, the wartime Alamogordo bombing range was put back into use for a Tactical Air Command gunnery training program known as the Frangible Bullet Project. Aircraft and personnel in this program were not regularly assigned to the base, but local shops and related facilities had to service the equipment used; and the more proficiency aerial gunners developed, the more repair jobs had to be carried out on the P-63 target planes.[3] At the same time, Alamogordo Army Air Field helped support the rocket firings conducted nearby at the Army Ordnance Department's White Sands Proving Ground. It played host to hordes of visiting

aircraft on V-2 firing days, when spectators came from far and wide to see the show, and regularly assigned maintenance crews proved insuffi[illegible]ent to handle the workload.[4] In addition, there were planes ac[illegible]ually stationed at Alamogordo on temporary duty or some other basis to support White Sands operations. Watson Laboratories, whose special mission was to provide and operate radar research and tracking equipment on the White Sands range, brought about a half dozen small- and medium-sized aircraft (such as L-5's and C-47's) for administrative and cargo flights, tracking flights to test radar equipment, and missile recovery on the range itself.[5]

In order to assist flight operations on the White Sands missile range, a supplementary landing strip known as Condron Field was prepared near the headquarters or "cantonment" area of the Proving Ground. This field was used by the aircraft stationed at Alamogordo and also by occasional missions flown from Biggs Air Force Base, El Paso, Texas, in support of the testing program. Flights from Biggs were for such purposes as recovery, liaison, and aerial survey; they usually consisted of one plane at a time, although more would be provided on firing days; and they were flown not as a regular function but as requested, on a day-to-day basis. In response to petitions from Army Ordnance Department, the first lieutenant at Biggs who had borne the brunt of flying missions for

White Sands was reassigned to duty with the Proving Ground--whereupon Biggs refused to let him fly its planes. Biggs continued to lend aircraft, but the Proving Ground pilot could go along merely as a passenger, a problem wholly solved only when the Proving Ground obtained its own assigned aircraft. Condron Field was also used by an assortment of private planes, some belonging to "prominent civilians of surrounding cities" and others to organizations connected with the Army's missile program. Douglas Aircraft Company, which as far back as 1946 was conducting research and development on the Nike antiaircraft rocket, operated a biweekly freight and passenger service with one C-47 between Condron and its Santa Monica home office.[6] Nevertheless, Condron operations, including those actually flown from Biggs Air Force Base, remained small in scale compared with operations of one sort or another at Alamogordo Army Air Field.

What is more, the number of base-assigned planes at Alamogordo, which had been exactly one in the spring and summer of 1946, began to climb again in November 1946 and reached twenty-five, including thirteen P-63's, the following February.[7] This change followed the regular assignment to Alamogordo Army Air Field of the Consolidated Gunnery Training School of the Eighth and Fifteenth Air Forces. The Gunnery Training School took the place of (and in a sense absorbed) the Frangible Bullet

Project; and neither one had anything to do with air support of missile tests. But the new training program was short-lived, lasting only from November 1946 to March 1947, when the Alamogordo base was transferred to the jurisdiction of Air Materiel Command for use in the Air Force's own guided missile program. From that time onward, flight operations at Alamogordo Army Air Field, soon renamed Holloman Air Force Base, had only one primary objective: the support of testing and development programs in guided missiles and related fields.

The change in function and command jurisdiction was promptly reflected in the base aircraft inventory. Although the Watson Laboratories' aircraft detachment remained on a separate footing as before--and was not amalgamated with base-assigned aircraft until some months later--planes belonging to the Consolidated Gunnery Training School were removed and were replaced by others required for the new mission. In April, the first full month of Air Materiel Command operations, the assigned inventory (i.e., not including Watson Laboratories aircraft) was thirteen as compared with February's twenty-five.[8] This reduction reflects the fact that the amount of actual flying required for test purposes was at first fairly modest. The number of projects was not great, and the flight requirements for any one project were usually well spaced. Colonel William H. Baynes, who commanded the base in 1949-52, was able to write that flight operations

were "a minor part of the overall activity" at the base.[9] Nevertheless, by the time Colonel Baynes' command ended, all the basic types of air support were evolved that have continued at Holloman down to the present.

The most common type of direct air support to missile projects, including the earliest V-2 firings at White Sands, was range recovery--spotting an impact point, leading in ground recovery crews, or even recovering the missile wholly by plane. In this field the L-5 was pre-eminent at first, but other small, low-speed aircraft were also used; helicopters joined the recovery fleet before long, although none were present originally.

A type of air support almost as widespread as recovery was the chase function, which could be seen in perhaps its purest form on high-altitude research balloon missions; in such cases the balloon was escorted by Holloman aircraft throughout its cross-country wanderings, and the same aircraft would participate in final recovery. More common, however, were photographic chase and safety chase on the Holloman range itself. A single plane might perform both services, if both were needed on a given mission, or one might be used for photography and another for safety control, keeping a watch for any dangerous malfunction during a project test and standing ready to shoot down the test vehicle if conditions demanded. For either variety of chase, fighter aircraft were normally best suited. However, the

photographic function could sometimes be performed without any chase aircraft at all, simply by mounting cameras on a launch aircraft.

Launch aircraft represented a slightly more limited category of air support, since obviously no launch plane was used for a ground-launched missile. On the other hand, neither was air-launching used only for missiles in the strict sense, such as the Rascal strategic bombardment missile and the Tarzon radio-controlled bomb, which were among the earliest projects brought to Holloman by Air Materiel Command. Air-launching was likewise used to test parachute systems for the safe recovery of test vehicles, and, starting in mid-1952 at the latest,[10] for dropping parachute targets.

As one would expect from the analogy with conventional bombing, bomber aircraft were extensively used for launch purposes. But for some projects--such as small missiles and reduced-scale models of larger ones--fighters were equally or more suitable and were used from the outset.

A launch plane might also conduct captive flight tests, simply by not letting go of the missile. But captive testing was susceptible of a great many variations, since the parts of a missile system could be tested individually and the aircraft requirements in each case were not necessarily the same. For instance, the Rascal and its reduced-scale version known

as Shrike always used one of several bomber-type launch planes, but the guidance mechanism alone could be and was mounted in F-80's for captive flight testing. In this case the F-80 was accompanied by a B-17 (later changed to B-50) to give the guidance signals; the fighter acted as a simulated missile, and the bomber as a director aircraft.[11] Indeed it was part of the basic Rascal concept for the launch plane to be equipped as a director and give signals to the missile over the first part of its course after it was launched. Thus, in a free-flight test of this particular system, both launch and director support were always required, even if performed by the same aircraft. However, a more typical use of director aircraft was in drone operations, meaning either the development of new drone types or the operational use of target drones in missile-testing. Operational drone flights at Holloman really date from the arrival in September 1951 of a drone detachment from Air Proving Ground Command that has since developed into the 3225th Drone Squadron.[12] And certainly the most common director of all was the B-17, which not only performed this function in the first F-80/Rascal tests but became a mainstay of the Drone Squadron as well.

A final type of direct air support required in missile-testing was the tracking mission, in which an aircraft was flown for the purpose of testing instruments on the ground.

The latter might be only the normal range instrumentation, or the object tested could be the guidance mechanism of a missile, to see if it would effectively "pick up" a simulated target.

Just as a single plane could perform more than one support function in the same test, it was also possible for a plane to fly on tests in support of more than one project. This was taken for granted in the case of recovery missions, for which requirements did not vary much from project to project. Launch aircraft were not so easily interchangeable, because of widely varying missile sizes and characteristics, special equipment needed, and so forth. It was possible for one B-29 to launch both the Tarzon bomb and a parachute recovery test vehicle for Shrike,[13] but clearly no fighter-type launch aircraft could do the same. Chase aircraft fell somewhere between recovery and launch aircraft with respect to interchangeable status. Even so, research and development inevitably required a larger number of aircraft types in proportion to total aircraft that did, say, a tactical or training mission. The thirteen base-assigned planes of April 1947 were divided into eight different major types; by October 1952 the base had seventeen aircraft of ten different types.[14] To be sure, test support aircraft were only part of this inventory. A few cargo and liaison planes were always needed for administrative, logistical, and other non-test flights which had to be carried out whether or not they had

any direct relation to the mission of the base. Colonel Paul F. Helmick, the first base commander after the shift to Air Materiel Command, personally took to the air on 4 July 1947 to airlift patients from Holloman to the Army's William Beaumont General Hospital at El Paso, Texas. He likewise flew a C-47 in 1949's "Operation DDT," carefully spraying his own base for purposes of insect control.[15]

The aircraft totals mentioned above naturally do not tell the whole story, since there were always numerous aircraft stationed at Holloman that were not technically "base-assigned." If the planes assigned to Watson Laboratories, basically a tenant activity, were included in the total for April 1947 the figures would be twenty aircraft of nine different types. One must also take account of planes bailed by the Air Force to private contractor companies engaged in development work at Holloman, for bailed planes began to appear very early in the history of the missile program--e.g., a P-47, the only one on base, which was bailed to Republic Aviation Corporation for use as a launch plane for the one-ninth scale model of Republic's MX-773 ramjet missile.[16] Then, too, planes were occasionally brought to Holloman on loan from other bases, usually to participate in specific tests: an example of this procedure was the loan of two F-80's from Williams Air Force Base, Arizona, to be used as safety chase aircraft in a test of the JB-2 jet-bomb

missile in July 1948.[17] However, records of bailed and loaned planes are very inadequate, so that it is impossible to state exactly how they affected the total number of either aircraft or aircraft types.

By and large, the number of aircraft present was adequate throughout the period under consideration. In February 1952 and for several months thereafter the base had not one administrative aircraft assigned,[18] but presumably planes coded for other duties were diverted as needed, and there is no indication that major difficulties resulted. Nor is there any indication that Holloman ever suffered a serious shortage of test support planes, although a project might still be handicapped temporarily by a delay in the scheduled arrival of a particular type. One of the many strokes of bad luck that have plagued the Rascal missile system was a strike at the home plant of Bell Aircraft Corporation in Buffalo, New York, which interfered with modification work on the first B-50 assigned to the project and so held up the plane's arrival for many weeks. Then, after the strike ended, the plane suffered an in-flight accident during a preliminary test mission at Buffalo, causing still further delay; when the B-50 finally reached Holloman it was a half year late.[19]

Even after an aircraft reached Holloman it was not always available when needed. For instance, the Martin Matador project

was grounded in September 1949 for lack of both command control (i.e., director) and chase aircraft to accompany the missile on test flights. In this case both the DF-80 and the F-84 aircraft normally used were out of commission,[20] and naturally there were other cases, too, in which aircraft out of commission hampered the work of a project. It is even surprising that this did not happen more often. Not only was there a certain amount of aircraft modification work that had to be carried out in the Holloman maintenance shops, as project requirements demanded, but also the entire base maintenance function labored under the handicap already mentioned of a high ratio of aircraft types to total aircraft. In this connection it is worth noting that the base was partially responsible even for the maintenance of planes bailed to mission contractors. The original Rascal project B-50, which was seemingly the first B-50 ever to alight at Holloman, was bailed to Bell Aircraft Corporation but was maintained by the base.[21] A B-29 bailed to Lockheed Aircraft Corporation in 1951 was to be maintained seventy-five percent by the base and twenty-five percent by the contractor.[22] In certain other cases the records do not indicate who performed maintenance, but even if a contractor assumed full responsibility the base could be called on to provide auxiliary supply services, which was not always easy if a plane was of a type not present in

the assigned inventory. Yet despite these difficulties, and despite intermittent complaints of a shortage of maintenance personnel[23]--which was not, of course, unique with Holloman--the record on maintenance was generally good. Soon after Holloman was transferred to the newly-formed Air Research and Development Command, in 1951, Lieutenant General Earle E. Partridge took time as Commanding General to pay tribute to the "excellent" quality of "aircraft and equipment maintenance" at Holloman as revealed by a special staff visit. This record was all the more notable, he pointed out, when contrasted with the general inadequacy of maintenance at other installations in the command.[24] The supply system also appears to have functioned smoothly on the whole; indeed Holloman went from December 1951 to June 1952 without a single plane out of commission for parts.[25]

Some trouble, but less than one might expect, was caused by the assortment of occupational hazards that were faced by all planes used in air support operations. In April 1949 an F-84 shot down an experimental OQ-19 drone, was hit on the wing by part of its disintegrating target, and was wrecked on crash-landing;[26] but this was quite exceptional. In the case of drones, particularly operational drones, being shot at and damaged was a recognized part of their mission, but the degree of damage still varied. A drone could often be repaired, or

a "new" drone put together out of parts left over from several others that were unrepairable. The hardy QB-17's above all have had an enviable salvage rate. In any event, drone repairs put still another burden on the maintenance shops, and sometimes on other units as well. In the summer of 1952 it was necessary to build a road into the desert for the express purpose of hauling out a QB-17 that was forced to land there after being hit by a missile.[27] This was apparently the first road built to order for a drone, but it was not destined to be the last.

Some of the physical facilities available for aircraft maintenance and the like also served at times as occupational hazards of Holloman testing. In mid-1951 a B-50 was set on fire and suffered considerable damage as a result of an explosion overhead among the hangar lighting fixtures. All these were of "conventional or incandescent, exposed-bulb type,"[28] matching the hangar buildings themselves which were of semi-permanent wartime construction. For that matter, the concrete aprons and taxiways were also in poor shape. A November 1951 inspection revealed an apparently complete lack of preventive maintenance since the time they were built, which again was during World War II; new breaks and cracks had never been sealed, and the original joint material was badly deteriorated. In this case, and also that of the exploding light fixtures, needed improvements were authorized.[29] In addition, Colonel Helmick requested

an extension of the three existing runways on the ground that their 8000 to 8400-foot maximum length was likely to inhibit operations, but nothing was done about this until 1955.[30] On the other hand, two subsidiary landing strips were prepared in 1951 in the northern portion of the Holloman range. Both were suitable for C-47 type aircraft, and were designed to offer quick access to proposed instrumentation sites two or three hours distant by land from the main area of the base.[31]

Of all the resources needed for air support operations, the pilot staff seems to have posed fewest problems at this time with respect to either quantity or quality. Forty-nine pilots were assigned in August 1951 and sixty-four in May 1952. Either total was more than ample for normal operations, even though all base-assigned pilots then had other duties besides flying that usually demanded far more of their time. Moreover, the Drone Squadron and probably several of the mission contractors had full-time pilots of their own.[32] In a few cases there might still be a lack of qualified persons for specialized flight-crew positions--Trizon bomb launchings, for instance, were cancelled in September 1951 because the only available B-29 (launch aircraft) engineer was suddenly hospitalized[33]--but such crises certainly were not frequent.

In addition to the conduct of Air Force missile tests at Holloman, the base continued to provide a certain amount of

support to the similar operations of both Army and Navy at the Army's White Sands Proving Ground. This support, as mentioned above, had started before the Air Force brought its own missile program to Holloman. Though the total effort required was never great until some time after the official integration of the Holloman and White Sands ranges in the latter part of 1952, the responsibility was already becoming rather complex.

One aspect of air support for White Sands was Holloman's growing involvement in the operation of Condron Field, the Army landing strip located in the vicinity of Proving Ground headquarters. Condron was used from the outset by at least some of the planes based at Holloman, but any regular Air Force supervision over operations there was entrusted originally to Biggs Air Force Base, which also granted landing clearances to transient aircraft when needed. Biggs likewise continued to give the Army a certain amount of direct flight support: in March 1949 the Tow Target Squadron at Biggs had five pilots and six L-5's performing search and recovery missions on the White Sands range.[34] These L-5's naturally used Condron Field, and when the Proving Ground obtained a C-47 (or C-45--the documents give both designations) and an AT-11 of its own they were stationed there permanently. An inspection of activities at Condron about February 1949, by a Strategic Air Command inspector, revealed

a long list of rather serious discrepancies. Maintenance, including hundred-hour inspections, was being attempted by Army enlisted men who were not current in their specialties and lacked qualified supervision; the two planes assigned to the Proving Ground were being flown with incomplete flight crews and were in "very poor condition"; and so it went. The basic trouble seems to have been that Condron, in the words of a visitor from Headquarters, United States Air Force was "attempting to operate as a small Air Force Base, whereas it was originally authorized...to be used as an emergency landing strip, and as a pick-up and discharge point for VIP flights...."[35]

Air Force headquarters accordingly prescribed and obtained a radical reform in the methods of operating Condron Field. The field remained physically under care and jurisdiction of the Army, but final responsibility for all Air Force activities there--and likewise general supervision of flight operations--was transferred from Biggs to Holloman. The latter was deemed better fitted for the task in view of the close connection between its own mission and that of the Proving Ground. All clearances would have to be made henceforth through Holloman; and the two Army planes were ordered physically moved to Holloman, where they could be properly maintained by Air Force personnel. Since it took scarcely longer to fly from Holloman to Condron than to reach Condron by car from Proving Ground

headquarters, it was assumed that no serious delays would be encountered under the new arrangement and that efficiency and safety of operations would be enhanced. However, after the planes were transferred they had to be temporarily grounded until overdue technical order compliances and inspections were carried out.[36]

Still more planes were brought to Holloman later for the express purpose of assisting the Army at White Sands. A B-26 arrived at the end of 1949 on 60-day loan from Langley Field, Virginia, to conduct radar tests and the like in the Army's Nike program. In due course it was assigned permanently, in order to serve not only the Nike program but a variety of Army and Air Force projects.[37] Another B-26 for the use of White Sands Proving Ground arrived in July 1950, at which time a meeting was held to work out arrangements for the combined use of aircraft stationed at Holloman. Holloman officials pointed out that they lacked maintenance capability to keep all the aircraft currently on hand in flyable status, and that the hours of operation for each aircraft were not sufficient anyway to warrant maintaining all of the same type constantly in service. Hence it was agreed that the White Sands planes should be used, maintained and, when advisable, stored interchangeably with similar aircraft assigned to Holloman.[38]

Holloman still did not assume responsibility for assisting

White Sands recovery missions; the Air Force share in this particular task continued to be performed by Biggs Air Force Base even after other support functions had been taken over by Holloman.[39] But Holloman did add one more service of its own--drone target missions--after the arrival in 1951 of the Air Proving Ground Command's Drone Squadron. Army spokesmen sometimes complained because there were not more drones to shoot at, but the Air Force would have liked more, too, and the quality of drone support was apparently quite satisfactory.[40] On the whole, in fact, Holloman could be rather well satisfied with the support that it rendered in all the years from 1946 to 1952 both on its own range and at White Sands. The human and material resources available to do the job were not great in quantity, but then, as Colonel Baynes had said, flight operations were "a minor part of the overall activity." The great change in scale of air support was still a few years off; and, before it materialized, the formal integration of the Holloman and White Sands Proving Ground test ranges was to place the entire problem of air support into a new framework.

NOTES

CHAPTER I

1. Below, p. .

2. "History of Alamogordo Army Air Field"[hereinafter cited as "History of AAAF"], March 1946, supporting document 26; April 1946, p. 13; July 1946, pp. 1-2.

3. "History of AAAF," June 1946, supporting document 14.

4. Ibid., p. 6.

5. "History of AAAF," passim; telephone interview, Lt. Col. Wilbur D. Pritchard, Deputy for AF, IRM, WSPG, by Dr. David Bushnell, HADC Historian, 10 April 1957.

6. "Historical Information, White Sands Proving Ground, New Mexico, 9 July 1945...31 December 1952," pp. 44, 50.

7. "History of AAAF," 19-30 November 1946, p. 16; February 1947, p. 40.

8. "History of AAAF," 1-15 March 1947, p. 25; April 1947, pp. 27-28; telephone interview, Col. Pritchard by Dr. Bushnell, 10 April 1957.

9. Ltr., Col. William H. Baynes, Cmdr., HAFB, to Brig. Gen. W. G. Smith, subj.: [Control Tower Service], 23 August 1951.

10. "Historical Report...Holloman Air Force Base, New Mexico, 1 July 1952 to 31 August 1952," p. 62.

11. "Historical Report, Holloman Air Force Base...1 September 1951-31 October 1951," p. 68; "Historical Report, Holloman Air Force Base...1 January 1952-29 February 1952," pp. 91-92; History of Holloman Air Development Center 1 January 1953 - 30 June 1953, p.60.

12. 1st ind., Capt. Ralph N. Andrews, Jr., Adjutant, 3205th Drone Group, Eglin AFB, 22 May 1957, to basic ltr. from Dr. Bushnell, subj.: [History of 3225th Drone Sq.], 6 May 1957.

13. HAFB, Progress Summary Report on U.S.A.F. Guided Missile Test Activities, 1 May 1949, p. 82.

14. "History of AAAF," April 1947, pp. 27-28; ARDC Reference Book, October 1952.

15. "History of AAAF," 1 July - 31 December 1947 p. 58; "Historical Report on Holloman Air Force Base, 1 January - 30 June 1949," p. 3.

16. HAFB, Progress Summary Report, 1 February 1948, pp. 41-42.

17. Ibid., 1 July 1948, p. 27.

18. HAFB Reference Book, June 1952, pp. 15, 17.

19. HAFB, Progress Summary Report, September 1949, p. 77; October 1949, p. 87; December 1949, p. 90; February 1950, p. 82.

20. 2754th Experimental Wing, HAFB, "Historical Report for Operations and Projects for the month of September 1949," p. 8.

21. HAFB, Progress Summary Report, May 1950, p. 100.

22. Telephone interview, Mr. Lawrence V. Overell, Contract Specialist, Alamogordo Air Procurement Office, by Dr. Bushnell, 11 April 1957.

23. Cf. "History of AAAF," April 1947, p. 28.

24. Ltr., Lt. Gen. Earle E. Partridge, Cmdr., ARDC, to CG, AFMTC, subj.: "Staff Assistance Visit to HAFB," 3 December 1951. Partridge gave special praise to the engine conditioning program, maintenance control function, and degree of cooperation with San Antonio Air Materiel Area.

25. 6580th Maintenance and Supply Group, "Historical Data... July 1952." Presumably this refers simply to base-assigned aircraft.

26. "Historical Report on Holloman Air Force Base, 1 January - 30 June 1949," p. 16.

27. "Historical Report...Holloman Air Force Base, New Mexico, 1 July 1952 to 31 August 1952," p. 115.

28. Ltr., Col. Baynes to CG, ARDC, subj.: "Project ALA 2B 38, Replace Lights in Hangars, HAFB," 24 September 1951.

29. Ltr., Hq., AMC to CO, 6540th MTW, HAFB, subj.: "Expansion Joint Seal, Concrete Aprons and Taxiway, HAFB," n.d. but about November 1951; 2nd ind., Hq., ARDC to CO, 6540th MTW, 16 November 1951, to basic ltr., Col. Baynes to CG, ARDC, subj.: "Project ALA 2B 36, Renovation of Hangar Building 301, HAFB," 24 September 1951.

30. Ltr., Col. Paul F. Helmick, Cmdr., HAFB, to CG, AMC, subj.: "1950 Fiscal Year Building and Facilities Program," 6 March 1948, with incls.

31. "Historical Report, Holloman Air Force Base...1 January 1951-2 April 1951," p. 29.

32. HAFB Reference Book, June 1952, p. 17a.

33. "Historical Report...Holloman Air Force Base, New Mexico, 1 March - 30 April 1952," p. 78.

34. Ltr., Maj. James C. Petersen, Base Executive, HAFB, to CG, AMC, subj.: "Operational Control...WSPG," 29 March 1949.

35. Ltr., Col. J. W. Sessums, Jr., Deputy Director, Directorate of Research and Development, Office, DCS/M, Hq., USAF, to CG, AMC, subj.: "Operational Control of Air Force Activities at Condron Field, WSPG," 9 March 1949. See also Petersen ltr., cited in previous footnote, and DF, Brig. Gen. O. S. Picher, Chief, Operations Division, Directorate of Plans and Programs, Hq., USAF, to Office of Chief of Ordnance, subj.: "Operations of AF Aircraft at Condron Field, WSPG," 9 March 1949.

36. See sources in above footnote.

37. Ltr., Capt. Harry M. Hook, Jr., Maintenance Officer, Langley AFB, Va., to CO, HAFB, subj.: "Condition of Transfer," 2 December 1949; ltr., Col. G. G. Eddy, CG, WSPG, to CO, HAFB, subj.: "Request for Permanent Assignment of B-26 Aircraft," 23 February 1950; ltr., Col. Eddy to CO, HAFB, subj.: "Permanent Assignment of B-26 Aircraft," 9 May 1950.

38. DF, Lt. Col. Eifler, Operations Officer, WSPG, to CO, HAFB, subj.: [Agreement between WSPG and HAFB], 24 July 1950. The AT-11 was to be disposed of as soon as possible, since

it was the only one of its type and thus posed a definite maintenance problem (ltr., Col. Eddy to Chief of Ordnance, subj.: "Exchange of Trainer Aircraft, T-11, for Cargo Aircraft, C-47," 6 April 1950).

39. 2nd ind., Lt. Col. H. W. Norton, Base Executive, HAFB, to CG, AMC, 10 April 1950, to basic ltr., Hq., USAF to CG, AMC, subj.: "Coordination of AF Requirements for CG, WSPG," 6 February 1950.

40. Ltr., Col. William H. Baynes, Deputy for Missiles, Directorate of Systems Management, ARDC Detachment 1 [and former Cmdr., HAFB], subj: [History of HAFB 1949-52], 5 April 1957.

CHAPTER II

AIR SUPPORT ON THE INTEGRATED RANGE: INCREASING SCALE AND COMPLEXITY OF OPERATIONS, 1952 - 1957

Air support at Holloman has changed far more in the five years from 1952 to the present than in the previous five-year period. The broad types of air support offered to users of the testing range have remained essentially the same, but all or nearly all have become more varied and complex in their application. Moreover, slowly at first but then steadily gaining momentum, the indices of tests performed, hours flown, and aircraft in operation have all shot upward. The number of organizations jointly using the Holloman range has also grown; and, meanwhile, the organizational basis of air support operations both at Holloman and at its neighboring missile test center, the Army's White Sands Proving Ground, has been considerably revised in order to cope with new conditions.

Range Integration and Air Support

From the time that the Air Force and Army both became engaged in missile-testing on adjacent tracts of the New Mexico desert they have liberally shared their problems and resources in common. The role of Holloman in playing host to aircraft assigned for work at White Sands is only one example of this

sharing, which was often accomplished on an informal basis, as need arose. But as the tempo of range operations increased, it became obvious that sooner or later some definite arrangements would be needed. The first solution adopted by the Defense Department, toward the end of 1949, was to offer the Army full control over both installations; the Air Force was to continue flying planes for test support off Holloman runways, but would do so as a service organization working for the Army, with tenant status in relation to White Sands Proving Ground and an expected total of about fifty officers and enlisted men. Whether such a plan would ever have been truly practicable is open to question, but it was never actually carried out. Instead, after prolonged inter-service negotiation, a new scheme was adopted allowing the Air Force to retain Holloman as an independent test center and providing for a careful division of functions and responsibilities on the White Sands and Holloman ranges, which henceforth were to be managed as an integrated whole.[1]

The revised plan was really carried out. It was codified in General Order Number 30, issued at the Proving Ground on 22 September 1952 and serving ever since as the fundamental law of the Integrated Range. Thereby the Army received ultimate control of the range itself, including mission scheduling and ground instrumentation, while the Air Force, logically enough, obtained command of the air--or at least of manned flight

operations and certain necessary related activities. To be exact, the Air Force was to "operate Holloman Air Force Base, air field, aircrafts [sic], weather stations, and will provide such other Air Force services as may be required for guided missiles and aircraft supporting activities for White Sands Proving Ground." The "other Air Force services" were elaborated a little more carefully in Technical Operations Order Number 6, issued on 7 October, which also changed "air field, aircrafts" into "air fields, aircraft" and thereby included subsidiary airstrips on the range without necessarily excluding any planes.[2] Condron Field, of course, had for some time been under the general supervision of Holloman Air Force Base, but only now did it actually become an Air Force rather than an Army installation.[3]

On the whole, the Air Force came out the junior partner in the process of range integration, but at least its responsibility was relatively clear-cut. It was directed to provide all classes of air support needed on the range, both for itself and for the other armed services, while at the same time it was relieved of such tasks as keeping ranchers and tourists off the remote corners of the range. There was just one qualified, though significant, exception to this definition of the Air Force mission: namely, that under General Order 30 recovery missions did not constitute, strictly speaking, a form of air support. Despite the fact that aircraft were used in spotting

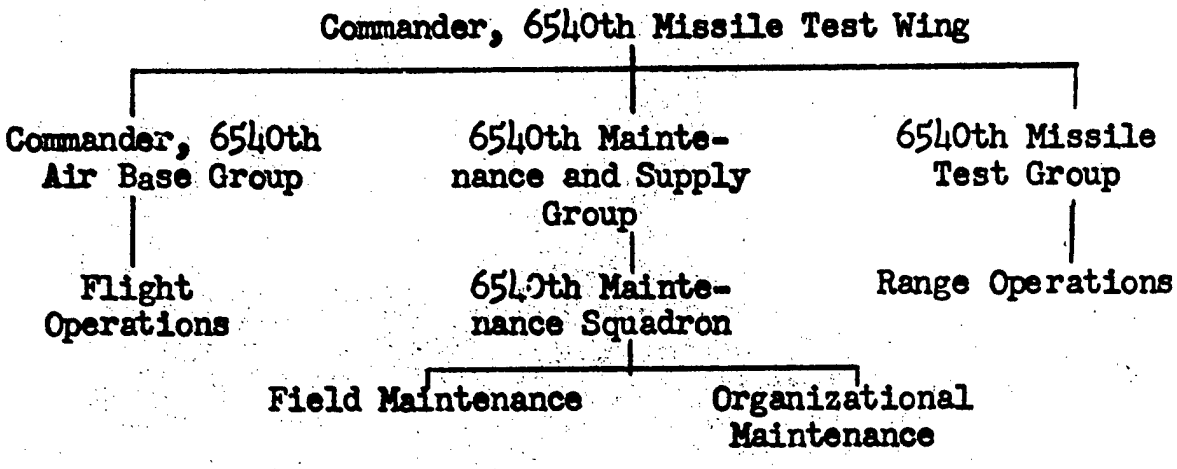
and retrieving missiles after impact, this one form of flight activity was lumped together with "range control and ground recovery services" and accordingly assigned to the Army. Henceforth neither Holloman nor much less Biggs Air Force Base was to provide recovery services, and the Army created a fully "integrated" recovery unit of its own, physically based at Holloman but serving all users of the range. Or at least missile recovery was to be treated in this manner, since balloon recovery--which frequently took place off-range--was shared with the Air Force and thus constituted a partial exception to the exception.

Units, Planes, and Men: The Division of Labor in Flight Operations

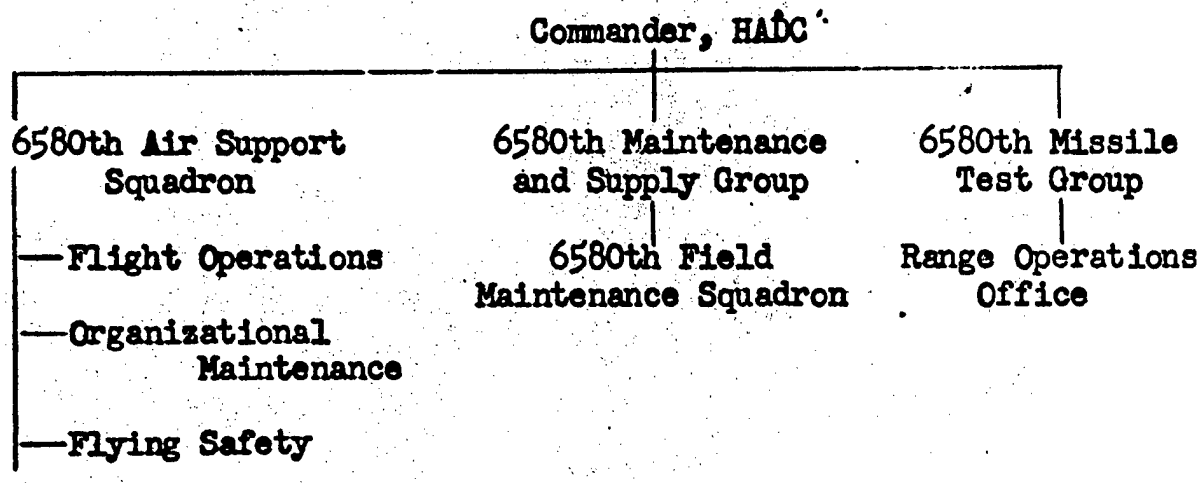
Even within the framework of primary Air Force responsibility for air support on the integrated range, there were several different units--including non-Air Force tenant units--engaged in providing the services in question. First and foremost was the 6580th Air Support Squadron, which took in all base-assigned pilots and aircraft. This squadron had been created only a few months earlier, through the combination of a flight operations section that was formerly a part of Air Base Group and an organizational maintenance section that had belonged (together with field maintenance) to the 6580th Maintenance Squadron of the 6580th Maintenance and Supply Group (see chart).

Organizational Basis,
at Different Periods, of Holloman
Air Support Functions

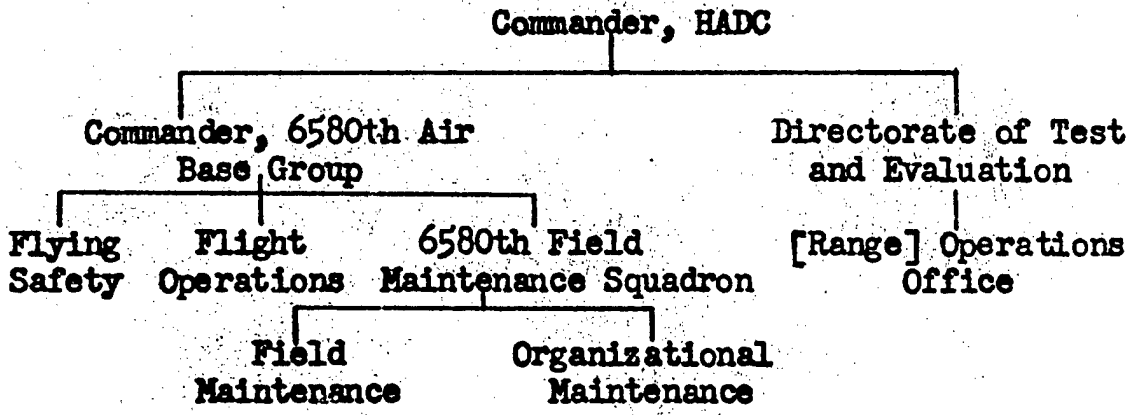
As of July 1951:



As of November 1952:



As of February 1955:



Source: See footnote 4.

Flying safety functions were also entrusted to the Air Support Squadron, but it shared actual scheduling of air support missions with Holloman's range operations office, located in the 6580th Missile Test Group, and with the appropriate Army officials at White Sands Proving Ground. The latter technically had the last word on range scheduling matters--with the notable exception, of course, that if Holloman claimed to be unable to provide air support on a given mission there was little the Army could do about it.[4]

Soon afterward flying safety was placed under the Deputy Chief of Staff for Operations,[5] and later still the Air Support Squadron was renamed 6580th Operations Squadron,[6] but the basic plan of organization was not changed until February 1955, when the Operations Squadron itself was disbanded and its functions divided among other units. The flight operations section (since renamed Flight Test Division) was moved back to Air Base Group; organizational maintenance was shifted to the 6580th Field Maintenance Squadron, which despite its misleading title was to perform both levels of maintenance on base aircraft. These arrangements bore a close resemblance to those in effect before the establishment of the Air Support Squadron. They were frankly designed to save manpower spaces, by concentrating maintenance functions in a single unit, and they have remained basically unaltered down to the present. The much-traveled flying safety

office is a different matter: in the February 1955 reorganization it moved over to become a special branch of 6580th Air Base Group, but in December 1956 it returned again to the jurisdiction of the Deputy Chief of Staff for Operations. The Holloman range operations office has been a more stable factor. Although it, and the larger Missile Test Group to which it was attached in 1952, have since then undergone their full share of the endless name changes that plague all Holloman activities, its relative place in the total plan of the Center has remained roughly the same. Currently it is the Operations and Plans Division (with Range Scheduling as a subsection) of the Directorate of Aircraft Missile Test.[7]

Throughout these repeated changes in organization, the number of base aircraft was growing steadily. In October 1952 the Air Support Squadron possessed seventeen planes representing ten different major types. At the end of 1956 its successor, the Flight Test Division, had thirty-nine planes and eleven major types (see chart). The peak in aircraft strength had been reached in May 1956, when Holloman listed forty-seven "inventory-possessed" aircraft.[8] To be sure, not all would be physically present at any one time. A C-47 might occasionally be sent off to Minnesota to assist north-country balloon launches,[9] and a part of the century-series fighter detachment was normally at China Lake Naval Air Station in support of Project Sidewinder.[10]

Aircraft and Aircraft Types: Holloman Air Development Center

Type	Oct 1952	Dec 1953	Dec 1954	Dec 1955	Dec 1956	Jun 1957
B-17	1					
B-25	2	2	2			
B-26	3	6	5	5	5	8
B-29	1					
B-47						2
B-50		2	3	3	3	1
C-45		3	3	3		
C-47	1	3	4	4	5	5
C-131				3	2	2
F-51	2	2				
F-80		1	4			2
F-86	3	4	4	4	2	
F-89			2			
F-94			1	10	6	5
F-100				1	11	12
F-104						1
H-5	2	1	1			
H-19			1	1		
H-21						2
L-4				1		
L-5	1	1				
L-16				1		
L-17		1				
L-19					1	
L-20			2	2	2	2
T-29					1	1
T-33	1	1	2	2	1	2
Total Aircraft	17	27	34	40	39	45

Note: All figures except those in the last column are from the tables of "inventory-possessed aircraft," as of the last day in each month, appearing in ARDC Reference Book. Figures in the final column were obtained from Aircraft Allocations Branch, Operations Division, DCS/O, as of 18 June 1957.

Holloman also came to have a roster of full-time duty pilots, a luxury which had been lacking (save in the tenant Drone Squadron) at least as late as June 1952.[11] Their number was still small--as low as seven, as of 22 April 1957--and was barely sufficient to meet the requirements for high-performance jet support flying, a job that Lieutenant Colonel Oakley W. Baron, Chief of the Flight Test Division, was hesitant to entrust to any of the much larger number of part-time pilots holding other positions at Holloman. For the sake of flying safety, and also as a matter of operating principle, Colonel Baron was committed to the concept of a group of highly-trained, specialized test pilots who would as far as practicable fly all air support missions at Holloman. However, non-duty pilots still perform a sizeable portion of the total mission flying, especially when reciprocating-engine aircraft are used, as on balloon chase.[12]

Although the official titles might imply a narrower function, the Air Support Squadron and its successors up to and including the present Flight Test Division actually had charge of all flying of base-assigned planes and pilots (duty or non-duty). This naturally took in countless training, logistic, and administrative flights in addition to direct mission support flying. Likely as not such flights had at least an indirect relation to the testing mission, as when planes were sent to gather up chimpanzees that had outlived their welcome at zoos around the

country and bring them back to Holloman's Aero Medical Field Laboratory to go balloon-riding or perhaps try out new seat ejection procedures.[13] Base-assigned planes and pilots also performed their full share of miscellaneous humanitarian flight missions, whether airlifting supplies to the flood-stricken Northwest during the Christmas holidays of 1955 or giving directions from the air to firefighters (many of them Holloman airmen and officers) in the nearby Sacramento Mountains in April 1956.[14]

As already noted, under General Order 30, Holloman was relieved of direct responsibility for missile recovery flights. This service was entrusted instead to a Holloman-based Army unit, Detachment 3 of the 9393rd Technical Service Unit, which has recently been redesignated (for the first and only time!) as simply Detachment 3, United States Army Garrison, White Sands Proving Ground. Detachment 3 came to Holloman in October 1952, and with its original fleet of five L-19's it successfully recovered every missile fired on the range during the next five months.[15] That record has since been spoiled, but the recovery service still ranks high for fulfillment of its assigned mission. Admittedly, it also has one advantage in that the schedule for finding missiles is not quite such a split-second affair as the schedule for firing them. Yet there are also some hard-to-find missiles that are likely never to be

recovered if not spotted at the very time of impact, and others that require immediate recovery for technical reasons. Lockheed Aircraft Corporation, for instance, attempts to land its test vehicles on a thin nose spike and must get quickly to them before a gust of wind knocks them over and causes damage.[16]

Detachment 3 on its part has also kept pace with the growth of range activity by increasing the size and quality of its aircraft inventory, which at the end of 1956 included eight L-19's, four L-20's, and six assorted helicopters, for a total of eighteen planes.[17] Moreover, while flying 15,000 hours from September 1955 to 21 January 1957 it managed to have the enviable safety record of not one reportable accident. When that record was finally broken, it was in a way that emphasized the unusual character of the detachment's operation: an Army plane was attempting to fly beneath a telephone line and unfortunately got caught.[18]

Although conceived primarily as a missile recovery unit, Detachment 3 has performed certain other duties as well. Indeed, the Joint Use Agreement drawn up between Detachment 3 and Holloman Air Development Center established an order of priorities for different types of Army flying missions. "Missile search and recovery" held first place, followed in order by tracking missions, "other missions...deemed necessary by the Commander, Holloman Air Development Center," Army Signal Corps missions, personnel and supply airlift "within the Integrated

Range," and in last place "administrative and training flights as deemed necessary by the Commanding Officer, Detachment III...."[19] Those missions "deemed necessary" by Holloman's commander have included, e.g., photo support of Air Force projects,[20] while administrative flights have in practice included cross-country runs for the staff of the Commanding General, White Sands Proving Ground.[21] Detachment 3 has also flown some missions not covered even by implication in the basic directives, such as helicopter rescue of lost visitors wandering among the dunes of White Sands National Monument.[22]

There has been ready cooperation at all levels between Army aviation and the base flying organization at Holloman. The Army on occasion has offered its pilots to fly Air Force helicopters,[23] and at other times Air Force planes and pilots have taken part (over and above their stated mission) in the basic Army task of missile recovery.[24] Holloman has provided air passenger transportation for White Sands Proving Ground, supplementing the work done in this respect by Detachment 3; in view of the limited resources possessed by Army aviation, Holloman's assistance was almost indispensable for such purposes as carrying very important persons in and out of Condron Field.[25] In addition, simply as a tenant organization at Holloman, Detachment 3 is both subject to overall Air Force supervision and control and automatically entitled to a broad array of standard base support services. The

Joint Use Agreement defines these services to include aviation fuel supply but not aircraft maintenance or supply of aircraft parts. The latter might be "borrowed" at times from Air Force stocks, on a strictly unofficial basis, but come normally through Army channels. The Army likewise set up its own maintenance capability at Holloman including a field maintenance unit which, unlike Holloman's 6580th Field Maintenance Squadron, does not do organizational maintenance but does take responsibility for servicing aircraft belonging to the New Mexico National Guard and to Fort Bliss, Texas. Since Fort Bliss has an aircraft detachment comparable in size to that of Detachment 3, Holloman officials have sometimes questioned the practice of performing field maintenance on its planes, noting that even though work was done by Army mechanics there was still a shortage of space and facilities in the maintenance area. When the Army pointed out that it would be both inefficient and against Army regulations to mount a full maintenance capability for no more planes than belonged to Detachment 3, Holloman gave some consideration to providing full Air Force maintenance for all Army planes regularly stationed at the local airfield. However, this was not done, and Fort Bliss continues to receive field maintenance support at Holloman.[26]

For a time Holloman also received assistance from, and gave base support to, a Navy aviation unit. This was a detachment

of Utility Squadron 3, sent to Holloman from its home base in San Diego for the express purpose of providing drone target missions. Regular full-scale operations began about 1 January 1953, with the naval detachment prepared to serve Navy, Army, and Air Force missile programs though in practice working mainly for the first two. By and large, its tenancy arrangements at Holloman closely paralleled those made with the Army aviation detachment.[27] It thus agreed to perform its own maintenance, although it performed a smaller part of the total workload at Holloman than did the Army. Periodic inspections, for instance, were accomplished by flying the plane back to San Diego. Nevertheless, from time to time assistance was informally asked and received from the Holloman maintenance shops, and there was even one Holloman facility--the aircraft washrack--that was used regularly by the Navy, although Navy personnel did the actual washing.[28]

The naval aircraft inventory reached a peak of sixteen--fifteen F6F's, including drones and directors, and one administrative SNB5--in mid-1954.[29] Just a year later, in June 1955, the Navy flew its last drone mission at Holloman.[30] Its aviation detachment had come originally to supplement the work of still another tenant unit, the 3225th Drone Squadron of Air Proving Ground Command, and by June 1955 the latter was prepared to shoulder the entire task of drone operations on the integrated

range. Accordingly, the Utility Squadron's planes and fliers returned to San Diego, and the only naval aircraft at Holloman since that date have been on temporary duty. Among other things, Navy planes and flyers have come to fire at Drone Squadron target drones in support of Project Sparrow and Project Sidewinder.[31]

The 3225th Drone Squadron had, of course, been present at Holloman ever since 1951. It has flown QB-17, QF-80, and Q-2 target drones for projects sponsored by all the armed services, and has also performed B-17 tracking missions for projects at White Sands Proving Ground. The latter do not form part of the squadron's primary mission, save in so far as they "directly influence future mullo flights," but have been performed to the extent that they are needed and have not interfered with drone operations.[32] The Drone Squadron sometimes lent a T-33 to the Air Support Squadron for photographic chase,[33] and it has performed its own training and administrative flights. It provides its own air-launch capability for the Q-2 drone, and on 24 December 1955 flew a big red B-17 over Holloman to launch 500 chocolate bars at children waiting below--a type of Air Force activity that has since been ruled out by Department of Defense directive. But the squadron has not been authorized to fly chase even on its own missions.[34]

This last function--chase support--is reserved for base-assigned pilots, and Drone Squadron officers have not been

entirely happy with the limitation, feeling that on Q-2 missions, at least, their own unit would often be better qualified to provide chase support. "Unofficially," in fact, Drone Squadron pilots on a few occasions have flown safety chase of the observation-monitoring variety though not the "hot gun" variety. The latter is actually the less important of the two, for it is seldom necessary to shoot down an errant or crippled drone and there is no guarantee of success even when the maneuver is attempted; as experience has shown, a drone may plunge off-range even after it is shot at.[35] Hence the original requirement that an armed fighter be airborne throughout a QB-17 or QF-80 mullo mission was modified in October 1955 to require "hot gun" coverage only for the "hot run" itself.[36] Later still, the requirement for an armed fighter to be airborne at least at firing time on all drone missions was quietly altered to permit the firing to take place even if for some reason no chase aircraft is available.[37]

The Drone Squadron, too, has steadily increased its aircraft inventory, which rose from modest beginnings to twenty-seven in May 1955 (when the Utility Squadron was ready to bow out) and thirty-seven in December 1956. This last total included fifteen B-17 drones and directors; nine QF-80 drones; two B-26's for Q-2 launching; ten T-33's for both training and director use (with the QF-80); and a single L-20.[38] Although it has a

partial maintenance capability of its own, the Squadron has made fuller use of the base shops than either the Army or the Navy tenant units. It has received help both on modification work and on major repairs, the latter including such time-consuming operations as the reconstruction of drones shot down by missile fire. The extreme case is probably that of a QB-17 downed on 18 October 1952 which had to wait in Holloman's field maintenance shops while a complete left inner wing panel was shipped in from Albrook Air Force Base, Canal Zone. With the help of nine mechanics sent on temporary duty from Kelly Air Force Base, Texas, the drone was finally made ready to fly again exactly 362 days and 6926 maintenance manhours later.[39] Similarly, the Drone Squadron has made regular use of Holloman supply services, both for aircraft parts and for other items. Even at a time when the Air Force assigned it the lowest supply precedence of any unit at Holloman, the base supply organization was always prepared to stretch a point in order to serve the Drone Squadron, as the latter gratefully acknowledged.[40]

Although not "tenant" units in the usual sense, those contractor companies that have project aircraft bailed to them stand in somewhat the same relationship to Holloman Air Development Center as the Drone Squadron or Army aviation. But the terms of bailment, the use to which a bailed plane is put, and the reason why it is bailed rather than base-assigned have

varied from one case to the next. Bailment is, essentially, a device whereby a plane can be reserved for the use of a single company on a project entrusted to it. This might be done simply because the base is not prepared to maintain aircraft of the type needed, or it might be that required modifications make it virtually impossible to use the plane except on one project. Or again a plane can be bailed because it is the only one that can do a job and there is danger that if used for additional purposes it might be out of commission just when needed for its primary mission. Since the testing program at Holloman began, one or more of these conditions have been present most typically in the case of launch aircraft. At the other extreme, they almost never apply in the case of recovery aircraft, which consequently have not been bailed. Neither are bailed planes commonly used for chase purposes, although some instances do occur.

In some cases bailed planes have remained at Holloman even after they were no longer needed. This is usually because of special modifications that would be difficult and expensive to remove and yet make the plane less desirable for other possible users; hence Air Materiel Command, which controls all bailment contracts, will sometimes allow a plane to sit idly on the ramp for months on end while searching for a new user. This has happened to both B-50 and B-36 launch aircraft bailed to Bell Aircraft Corporation for its Rascal project, once they were

phased out in favor of the B-47. The B-50's were finally disposed of after remaining virtually idle for a year. The two B-36's, on the other hand, were ultimately put back to use on a new version of the B-50 (B-17)/F-80 project, in this case using a B-36 launch aircraft as director with an F-80 that takes the part of a simulated missile. The Missile Countermeasures Division then attempts to jam the guidance signals, and valuable data has been collected. Obviously this is better than having the B-36's do nothing at all, but obviously, too, a B-36 is not the most economical aircraft for the program![41]

Whether they were actually being used or not, it is impossible to state exactly how many planes were bailed for work at Holloman at any given time in the past; adequate records simply have not been kept. However, a careful count made in April 1957 revealed some thirty-five,[42] which is closely comparable to the number of base-assigned planes. Like military tenant units, the bailment contractors supply their own pilots, who are often highly skilled in civilian test flying; indeed they have to be, if they are to cope with such emergencies as bringing back and landing a "hot" missile after a launch has been aborted or cancelled in the air. A pilot may jettison such a missile if the danger is too great, but many have been carefully brought back in order to save both the taxpayers' money and the time and effort that went into making

the missile.[43] At the same time, bailed planes uniformly obtain Air Force fuel; use drag chutes repacked by base personnel; and commonly (but not always) obtain replacement parts through base supply channels. If a bailed plane is of a type not present in the base-assigned inventory, Holloman may not even attempt to keep parts on hand, while in those cases where the bailment contractor is the same company that manufactures the plane it can provide more efficient parts service than the Air Force could possibly offer.[44]

The most obvious differences among bailment contracts concern maintenance arrangements; for, as noted in the previous chapter, the pattern varies from full contractor responsibility to full base responsibility, with combined base and contractor maintenance also possible. Nor will every plane bailed to one contractor always be maintained in the same way. Bell Aircraft Corporation once again offers a striking example: its bailed B-50's were base-maintained at the same time that its B-36's and B-47's were (and still are) contractor-maintained by private subcontractors (Convair-Fort Worth and Boeing Aircraft Company respectively).[45] Outright contractor maintenance is the most common solution, and the easiest from an Air Force standpoint, but it is also expensive. It is expensive above all when two contractors provide maintenance capabilities for aircraft of the same type and yet do not require a great amount

of flying from them. The Bell B-47's and two similar B-47 launch aircraft bailed to Radioplane Company for Project Crossbow are maintained by separate contractor organizations, but neither pair of B-47's is flown enough to make the fullest use of maintenance staff or facilities.[46] Such a case is far more likely to arise now than in the early days of missile-testing, when relatively few planes were bailed to a mere handful of contractors.

In addition to base-assigned, tenant, and bailed aircraft, there have been occasional groups of aircraft descending at Holloman for temporary duty on behalf of outside organizations. Two instances, relating to Navy test projects, have already been mentioned. But probably the most important example of this sort has been the program started in November 1956 by the Air Force Armament Center of Air Research and Development Command. The Armament Center needed to test certain fire control systems on century-series aircraft, an assignment that could best be carried out on the Holloman range; it therefore brought pilots and planes from Eglin Air Force Base, Florida, where the Armament Center is located, and some maintenance people besides. But it relied on Holloman for photo chase, dropping of parachute targets, and certain related air support services. Hence the visitors from Florida, who kept hard at work well into the spring of 1957, not only absorbed substantial

amounts of range time but placed an obvious strain on Holloman's air support capability.[47]

In still another case one of Holloman's tenant units, the 3225th Drone Squadron, played host to a temporary influx of planes and personnel sent to New Mexico by its own higher headquarters to get ready for Project Upshot, which finally took place in April 1953. This project was a series of atomic tests in the Nevada desert, in no way related to the primary Holloman mission. However, the test program called for flying mice and monkeys through an atomic cloud in drone aircraft; and Holloman became a scene of training activities and other preparations for the drone phase of the project. Although these preparations did not call for air support of the usual type from Holloman's Air Support Squadron, they did put a strain on certain other base facilities. For one thing, there was a run on base supplies of jet fuel, compelling Holloman to line up an alternative supplier.[48]

A rather different type of flying activity by off-base aircraft--worth mentioning chiefly for its nuisance value--has been the growing use of Holloman and also Condron fields by light civilian planes owned by the mission contractor companies or chartered to fly on their behalf. In one extreme case Felix Flying Service, a private firm, went so far as to obtain a state franchise from the New Mexico Corporation Commission to act as

air carrier in and out of Holloman, intending primarily to offer the contractor companies a charter service to up-range installations. The firm claimed further that its franchise gave it "exclusive" right to make chartered flights from Holloman airfield, although this claim was naturally rejected by base officials, and in the end Felix Flying Service did not set up regular operations even on a non-exclusive basis.[49] Continental Airlines, by contrast, was actually invited to begin scheduled passenger service from Holloman starting 1 September 1954. However, it is hoped that ultimately an improved Alamogordo municipal airfield will be able to accommodate not only Continental's airliners but also the numerous light planes used by contractor companies, which constitute a definite safety hazard when mingled with jet traffic at the same field.[50]

Continental Airlines was invited to Holloman for the indirect assistance that its service could give to the research and development mission. In other cases aircraft have been borrowed from different installations to render direct air support. When unable to obtain a base-assigned C-131 for tracking missions, the Range Instrumentation Development Division of Integrated Range Mission, an Army unit functioning at Holloman, solved its problem by borrowing a Beechcraft all the way from Aberdeen Proving Ground, Maryland. This was made possible by a considerable stroke of luck: namely, that the plane's pilot

at Aberdeen had a hankering to go west on temporary duty. He went back east again for Christmas leaving the assignment not quite completed, but it was finished enough.[51] Then, too, a specially-modified B-29 with bomb bay removed was brought from Edwards Air Force Base on two separate occasions as part of Project Cherokee, sponsored by Lieutenant Colonel (now Colonel) John P. Stapp and the Aero Medical Field Laboratory. This project involved experimentation with new seat-ejection procedures, using chimpanzee subjects, and the plane in question--which had already won fame as mother aircraft to the supersonic X-1--was unusually well fitted for the task.[52] It also posed some maintenance problems, because the last base-assigned B-29 had disappeared before its first arrival; but then maintenance problems are a fairly normal occurrence when it comes to borrowing aircraft, since a plane is not often borrowed if Holloman already has one of the same type.

In any case, borrowing began at an early stage of the Holloman testing program, and has actually been very common. During the two months of July and August 1955 Holloman was using the B-29 borrowed for Project Cherokee and another B-29 borrowed from Headquarters, Air Research and Development Command for Project Whoosh; an F-89D with firing error indicator borrowed from Air Proving Ground Command in support of the GAR-1 program; and various B-47's (another aircraft type of which

none was then present at Holloman) borrowed for two different projects and from four organizations--Air Force Special Weapons Center, New Mexico; Air Force Flight Test Center, California; Wright Air Development Center, Ohio; and Biggs Air Force Base, Texas.[53]

In some cases borrowing has meant that the aircraft is actually flown from a "foreign" base for a particular test, taking off in time to make connection with Holloman support aircraft and returning home as soon as it is finished.[54] This procedure eliminates the problem of maintaining borrowed aircraft, but it is not entirely efficient, and it is very unreliable if the aircraft to be borrowed is a scarce and much sought-after commodity such as the B-57 high-altitude light bomber. Holloman was instructed by higher headquarters to borrow a B-57 elsewhere in the command, when it proved impossible to assign one directly to the Center, but in April 1956 Colonel Otto R. Haney, Deputy Chief of Staff for Operations, explained that this procedure simply had not worked. In fact it

> ...taught us a rather expensive lesson, that required support cannot be provided if the B-57 is to be flown from a Base other than Holloman. Thirteen consecutive missions were attempted without completing one test operation. Difficulties in transporting and loading the parachutes at locations removed from Holloman, project launch equipment difficulties, communications, changes, 'holds,' slides in the range schedule and the unknown status of the B-57, all argue against the efficiency of such a set up.[55]

Admittedly, this is an extreme case, and under normal circumstances

borrowing (at least when the plane operates from Holloman) probably offers fewer difficulties than adding an entirely new type to the base inventory. However, the mere fact that Holloman has been forced to attempt expedients such as those described by Colonel Haney is evidence of the changing tempo of air support operations.

Growing Scale and Complexity of Operations

This change in tempo involved both quantity of missions flown and more elaborate requirements in all the basic categories of air support services. As the mere increase in number of aircraft will indicate, flight operations have now become a major rather than a minor part of total base activity. The same trend is reflected in the total hours flown by base-assigned aircraft, rising from 5571 in fiscal year 1953 to 7896 in 1954, 10,119 in 1955, 11,816 in 1956 and 5,051 in the first half of fiscal 1957.[56] Hours directly labelled in each case as test support flying were 3930, 4671, 6204 and 6412, but naturally much non-test support flying was also closely related to mission requirements. Moreover, the apparent decline in flying in July-December 1956 was both temporary and somewhat misleading. It reflects among other things a rash of difficulties that beset air support operations at about that time,

all of which will be considered in the next chapter, but even so the Flight Test Division reported at the end of 1956 that "traffic at this base, especially jet traffic, has increased to the point where the field is occasionally saturated."[57] In the following March operations at Holloman set a new record of 259 major test missions completed, the majority requiring some kind of air support; in May 1957 another record was set when total flying hours for the month reached 1300, including over 600 hours of primary mission jet time.[58]

This increase in number of missions required, among other things, a greater proficiency in timing. Support aircraft would most likely climb to mission altitude during the preceding mission, then land and refuel during the following mission so that they could be ready to fly again as soon as possible; and a delay at any point could well throw off the test schedule for the rest of the day.[59] The scheduling function itself likewise required more careful attention. Originally representatives of the Air Force, Army, and Navy worked out a schedule for joint use of the Integrated Range in a weekly meeting and, though changes repeatedly had to be made after the schedule was drawn up, this posed no great problem as long as the number of missions was not excessive and there was ample range time to go around. However, as the range became saturated, these constant changes led to serious inefficiency; it was especially

bad when needed range time went to waste as a result of late cancellations or just plain confusion. Hence effective 13 July 1956 a new system was adopted, with a daily conference at 1100 hours by intercom network taking the place of the weekly person-to-person meetings. Last-minute problems still occur, but the percentage of scheduled tests actually completed has risen. A further innovation is that Holloman now has only one representative at scheduling sessions, whereas formerly the Air Force range scheduling officer might be accompanied by observers or advisers from such units as the Drone Squadron and Flight Test Division. These units now must make known their exact capabilities to the Air Force scheduling officer prior to the daily session, so that he can speak in their behalf.[60]

The quantitative increase in air operations has been reflected further in expansion of physical facilities. New hangars have been built, including one for the Drone Squadron that was finished December 1956.[61] Similarly, a program of lengthening and strengthening the runways was completed in the spring of 1955. This was the first major work done on the runways since World War II and left Holloman fairly well equipped: of the four basic runways, each slightly over 8000 feet, two were lengthened to over 12,000.[62] The change was especially helpful to the Drone Squadron, whose operations require extra room to move around and thus had been sorely

hampered by the previous dimensions.[63] Longer runways were also necessary for maximum performance of large aircraft such as the B-36.[64] However, as these examples clearly suggest, the lengthening of runways and similar improvements have been designed to meet qualitative changes in air support as well as the sheer quantity of flying missions. These qualitative changes result both from the ever greater variety of projects with air support requirements[65]--for seldom do any two projects require exactly the same performance from support aircraft--and from the normal progress within any one project after it begins development. Such factors are difficult to measure, but a good indication can be found in the array of aircraft types (see chart), which have not increased appreciably in number since 1952 but have changed constantly in the direction of newer, higher-performance aircraft.

The change in aircraft types becomes even clearer if one considers the category of bailed aircraft, including those that are not technically bailed but are especially assigned to a contractor on some other basis and treated as bailed. Planes of the more advanced types usually make their appearance somewhat faster in the contractor than in the base-assigned inventory. In the bomber class, for instance, the base inventory from 1952 to 1957 was stripped of B-17's and B-29's while adding B-50's and B-47's, but these two types had both been

bailed earlier to Bell Aircraft Corporation (B-50's since 1950, B-47's starting in August 1954). Bell likewise received two massive B-36's, which the Center itself has never had.[66] As for the B-57, this was a type that Holloman was seeking for its own inventory as early as November 1954, but command headquarters did nothing until September 1956, when it could offer only the B-57A model that Holloman did not want because of expected maintenance difficulties and therefore refused to take.[67] Among the contractors, however, Hughes Aircraft Company brought in a bailed B-57 even before the command made its unsatisfactory offer to Holloman, and since then Northrop Aircraft Incorporated has acquired a bailed B-57E. Similarly, in the fighter category F-101's were bailed to McDonnell Aircraft Corporation and F-102's assigned to both Hughes and Convair while the Flight Test Division was still limited to F-100's.[68]

The appearance of Bell's B-36's and B-47's represente , specifically, a shift from preliminary work (e.g., the lighter Shrike prototype of the Rascal missile) to actual launches with a full-scale Rascal from planes that were intended to serve as operational carriers.[69] In the field of launch-type operations there was also a relative increase in the dropping of parachute targets, a trend due in part to the inability of conventional target drones to reach sufficient altitude. This was one reason why the B-57, with a capability for both high altitude and slow

airspeed, was ardently desired at Holloman.[70] Hughes used a project B-57 to drop high-altitude parachute targets for its Falcon missile, but the Flight Test Division had to use fighter aircraft for tasks of this nature. F-89's, F-94's, and F-100's were all modified to drop the high-altitude Pogo-Lo parachute target specially developed for the Navy's Talos program at White Sands. Indeed "Pogo drops" became a major facet of Holloman's total support for White Sands Proving Ground, at the same time that White Sands projects in general were steadily increasing their demands on Holloman for air support.[71]

A further change in the general area of launch operations was the relative increase in launching of fighter missiles such as Falcon as compared with bombardment missiles like Rascal. And just as the Rascal program finally began to launch from the B-36 and B-47, the Falcon program, which for a while accounted for over half the total Air Force tests at Holloman, had to keep up with the development of the new fighters from which Falcons would be fired operationally. The F-100 and F-102 were brought into the picture in 1956, and separate programs were established (known as the F-101 and F-102 Projects) for perfecting the fire control systems for those same aircraft when used not only with Falcon but also with other fighter missiles.[72] In all these cases the basic

launch aircraft were bailed to contractors, but Holloman was still called on to provide other types of air support. The F-101 Project received least support, simply because Holloman had no plane that could keep up with the F-101 when the latter was flown at or near maximum performance. Therefore the launch plane itself provided photographic coverage, by means of an array of cameras externally mounted; Holloman at most would send up some other jet to stand by for a possible post-firing damage inspection, in which case the F-101 would have to slow down at least enough to be looked at. The F-101 Project also brought with it some unusual safety problems. The first mission involving a triple salvo of Falcons, attempted 13 September 1956, resulted in a collision of missiles just forty feet ahead of the aircraft, which very luckily escaped harm.[73]

In those instances where chase support was actually provided--photographic, armed, or otherwise--there were far-reaching changes both in aircraft types and in the exact uses to which they were put. The last non-jet fighter chase aircraft, an F-51, disappeared in 1954, but even in the jet field itself the basic types of chase aircraft have been constantly changing. The jet chase "team" in 1952-54 consisted of the F-80 (or its trainer version, T-33), F-86, and F-89, of which the latter appeared rather late and never assumed a very large role. 1955 saw a conscious specialization in F-94's, and 1956 in the

F-100. The coming of the latter type was, of course, the really basic innovation, signifying that test operations were now shifting from subsonic to supersonic. The very first Holloman F-100 arrived early in 1955, primarily to provide chase support for the recently-established F-102 Project. But for some time it did not do much flying, since (among other things) as late as December of that year Holloman still did not possess a proved maintenance capability for it. Only in 1956 did the F-100 really come into its own.[74]

To be sure, even the most supersonic of projects may require subsonic chase aircraft for some purposes. The Lockheed X-7 is a supersonic ramjet test vehicle capable of such high speeds that no form of chase is even attempted during the main part of its flight. It does require chase support up to and including the launch phase, but a supersonic fighter would actually be too fast to stay with the B-50 launch aircraft.[75] Nevertheless, an ever greater number of missions have called for supersonic chase, which by definition must be performed by supersonic aircraft. Slower planes can at best offer an inefficient substitute, for instance attempting by difficult maneuvers to intercept a supersonic mission at just the right moment for photographic coverage of a particular phase.[76] Such techniques are not always reliable, for obvious reasons. Not only this, but higher speed was only one of the characteristics for which century-series aircraft were

needed. High-altitude capability was also essential, and the F-100 was the first fighter assigned at Holloman with a normal ceiling above 50,000 feet. Even if subsonic aircraft could sometimes manage to do the work of faster types, there was no conceivable way in which a plane with 45,000-foot ceiling could imitate the performance needed to fly at 50,000.

The F-100 still was not the best solution for all Holloman's chase requirements, for the ideal is usually to chase a plane with another plane of the same type. However, Holloman has never had the physical or human resources to maintain and fly the perfect aircraft for every type of mission, and thus settled on the F-100 as the best all-around choice. Its most glaring limitations have been in photographic work, since only the F-100F trainer model has two seats. In standard, one-seat models a pilot obviously cannot perform his own primary function safely and at the same time take adequate pictures with a hand camera, although this feat has been attempted by Holloman pilots. In order to escape this difficulty, the Center decided to mount cameras in the noses of F-100 aircraft, which was finally accomplished in December 1956, after many delays and still on a limited scale.[77] The new procedure proved excellent for some projects, e.g., the Hughes Falcon program, which seeks to photograph a missile in its course after launching and can now do so easily by following after in an F-100. On the other hand, nose

photography is not very satisfactory for catching an actual launch, when the missile or test vehicle normally drops away sharply from the launch aircraft before setting out on its appointed course. This is still another reason why the Lockheed X-7 program, which requires photographic coverage of the launch but not of the subsequent flight, does not find the F-100 entirely suitable. For launch photography as well as for covering the launch aircraft during its climb to position, Lockheed much prefers the T-33. But it will also settle for the two-seated F-94, which at the start of 1957 continued to play a major role in photographic if not all other forms of chase.[78]

The F-100 is also unsatisfactory for chasing an F-101, for the reasons already suggested. It is at least limited in its usefulness for high-altitude parachute drops, although the latter is not strictly a chase function; and still other limitations could be described. But at least the F-100 is more satisfactory than any present alternative, and it will remain the basic chase aircraft until outdistanced by the steadily advancing requirements of the testing program. Then it will go the way of the F-80, F-86, and other earlier types, to be replaced by either the F-101 or the F-104. The first F-104 was supposed to arrive in May 1957 in support of Project Sidewinder. It did not show up on time, but the first group

of Holloman maintenance people had already completed a factory training course on the F-104 by 1 April.[79] This was one case in which the base inventory was obtaining an advanced type sooner than any of the contractor companies.

In the preceding discussion nothing has been said about balloon chase, whose requirements are so different from ordinary chase support that they have little or no bearing on any consideration of the pros and cons of F-100 and other jet fighter aircraft. Major David G. Simons, Chief of Holloman's Space Biology Laboratory and a leading consumer of research balloons, has suggested that a T-33 could be very helpful in balloon work because of its ability to go up to and over cloud formations, and in actual fact both T-33 and F-89 jet aircraft have been used for balloon chase in Minnesota though not at Holloman. Even so, there have been changes in balloon chase operations at Holloman since 1952. One change is the passing of the B-17, which was once standard equipment for the tracking and recovery of balloons, but which fell prey to an Air Force-wide move to gather up the remaining examples of this famous type and modify them for drone operations. The B-17 has been replaced chiefly by C-47's and L-20's--the former for long-distance flights, the latter for short flights and sometimes also for monitoring the ascent of cross-country balloons.[80]

For both chase and possible emergency recovery or rescue

on manned balloon flights the helicopter also comes into play, and it is hardly surprising that helicopters, too, have undergone an evolution toward larger and newer types. The H-5 has been replaced by the H-19, and it in turn by the H-21, which was urgently requested because of its ability to carry heavier loads and reach higher altitudes in the surrounding mountains. The fact that one of Holloman's two H-19's was wrecked in the latter part of 1956 helped speed the transition to a newer type. Needless to say, Holloman has used its helicopters for a wide variety of purposes, test and non-test, in addition to balloon missions. And if one is needed for a balloon ascent on the plains of Minnesota, it will be borrowed from a local air base rather than brought all the way from New Mexico.[81]

One of the most striking developments since 1952 has been in the field of captive flight testing. The sub-gravity studies directed by Captain Grover J. Schack of the Aero Medical Field Laboratory bear little resemblance to captive flight tests of the conventional type, but that is essentially what they are--with both aircraft components and people as the subjects tested. Primarily, this is a biophysical research program designed to study the effects of zero gravity on human beings. It entails flying an aircraft in a high-speed ballistic trajectory so that the normal pull of the earth's gravitation is momentarily overcome, and originally an F-89 was used. When the project

aircraft crashed, the studies were resumed with an F-94C. The latter could be counted on to fly about thirty seconds in a zero-gravity trajectory but, unfortunately, odd things happened to the plane under such extreme operating conditions. Oil pressure kept falling to zero, hydraulic fluid leaked out, and so forth. These difficulties slowed down the program, but they were finally brought under control or, as in the case of collapsing oil pressure, shown to be of no significance during the brief period that a sub-gravity run lasted. Even so, the capability of the F-94 is limited, and Captain Schack therefore hopes to shift over ultimately to century-series aircraft. The F-100 could give a sixty-second trajectory, although for sub-gravity studies even more than for launch photography the two-seat F-100F is essential; the F-104, better still, would offer eighty-two seconds.[82]

There were also novel requirements in the tracking function. The Army's Hawk Project came forth with a requirement for tracking missions at 4000 feet measured from sea level, something that could not possibly be done at Holloman (altitude 4094 feet) but could just barely be accomplished in the vicinity of Condron Field (altitude 3930 feet), provided Air Force regulations against flying below 500 feet above terrain were not merely stretched but waived completely. Since this coincided with other special requirements for missions below 500 feet--e.g., to give

photo coverage for ground launching of the Matador missile--permission to make exceptions was granted by Air Research and Development Command on 18 January 1957.[83] (Later still, the Hawk Project began actual launches against drone targets at similar altitude.[84]) Tracking missions were also the ones chiefly benefited by a relaxation of weather restrictions on test support flying. The Flight Test Division's Standard Operating Procedure 25 was revised provisionally on 9 April 1957 and definitely on 17 May to permit them to be conducted both in and above an overcast, whereas other test missions were still normally forbidden within an overcast and were allowed above one subject to somewhat stricter limitations.[85]

A refinement on the tracking function that has gained in importance over the last few years has been the use of a monitoring aircraft to receive and analyze rather than simply to reflect signals. Development of the Crossbow missile system, which aims to seek out and destroy radar installations, was hindered by guidance irregularities that project officers suspected were due to stray radiation from off-range sources. But this hypothesis could not be tested until, after some delays, a specially equipped B-25 was sent aloft in December 1954 as a frequency monitoring aircraft. The B-25 confirmed the presence of stray radiation and thereby enabled the project not only to cope with this one difficulty but to isolate still other

irregularities that could not be accounted for simply on the basis of stray radiation.[86]

Whether tracking is of the active or passive variety, the most elaborate missions are currently performed by C-131 "test-bed" or "flying laboratory" aircraft. The first C-131's were acquired in 1955, one for the White Sands Signal Corps Agency and another for Holloman's own Missile Countermeasures Division, which had it specially modified for aerial reconnaissance and jamming of missile guidance signals. At the end of 1956, a T-29, essentially similar to the C-131, was brought in for use in the Army Vulnerability Program.[87] Alas, C-131's have presented one awkward problem in that they are just too big and comfortable and so are highly preferred for cross-country flights. Command headquarters in the summer of 1955 became alarmed over their use for such purposes, not so much because the Holloman mission was suffering--the planes in question still had not been fully modified for test use at that time--but simply for fear of unfavorable reaction in Congress. As one Holloman officer expressed it, C-131's had landed at various bases "with low rank on board and the criticism has come from General Officers of other Commands who have been unsuccessful in getting VC-131's...."[88] Hence a ruling was laid down to the effect that C-131's should not normally be flown except to other Air Research and Development

Command installations.[89] This did not quite end the C-131 problem, since a later reproof was issued by Center headquarters as a result of a C-131 being used to carry "morale flights and showtime troupes" in and out of Burbank, California, in apparent violation of Center policy.[90]

However, there were also some far more serious problems faced by the air support function at Holloman, notably in the course of calendar year 1956. For a while these problems attained almost crisis stature, and they must be examined in more detail in the following chapter.

NOTES

CHAPTER II

1. Historical Branch, HADC, Integration of the Holloman-White Sands Ranges 1947-1952 (April 1957); interview, Col. William H. Baynes, Deputy for Missiles, Directorate of Systems Management, ARDC Detachment 1, Wright-Patterson AFB [and former Cmdr., HAFB), by Dr. David Bushnell, HADC historian, 5 April 1957.

2. Technical Operations Order 6 is reproduced as Appendix A.

3. Ltr., Col. Don R. Ostrander, Cmdr., HAFB, to CG, 1800th AACS Wing, Tinker AFB, subj.: "Control Tower Operations at Condron Field, New Mexico," 10 October 1952.

4. Organization charts, in M & O Division, HADC; Comptroller, HAFB, "Organization and Functions," April 1952; Historical Report, Holloman Air Development Center, 1 September 1952 - 31 December 1952, p. 17, and organization chart in annex to same; interview, Maj. Archer W. Kinny, Jr., Asst. Dep. Dir. of Aircraft Missile Test, by Dr. Bushnell, 19 March 1957; The Historical Report cites documentary evidence that the Air Support Squadron was organized 1 November 1952, but it already existed full-grown according to the April 1952 "Organization and Functions" book. Very possibly it had been set up on a provisional basis and obtained final authorization only as of 1 November. The organization existing prior to the Air Support Squadron--with flight operations under Air Base Group and all maintenance in a single unit--had been in effect at least as far back as April 1951, when the base belonged to Air Materiel Command (Organization chart, April 1951, in M & O Division, DCS/O).

5. DCS/C, HADC, "Organization and Functions," June 1953.

6. "Historical Data on HAFB," photostat table, no date, in M & O Division.

7. M & O Division, "Organization & Functions Chart Book," 1 March 1955 and later supplements; telephone interview, Mr. James O. Rogers, Asst. Chief, M & O Division, by Dr. Bushnell, 8 May 1957.

8. ARDC Reference Book, May 1956. Other "peaks" might be given, depending on the system for counting, but none

would be greatly different.

9. Cf. Operations Division, DCS/O, "Historical Data...1 July-31 August 1955."

10. Flight Test Division, "Historical Data...1 July-30 September 1956."

11. Holloman AFB Reference Book, June 1952, p. 17a.

12. DF, Lt. Col. Oakley W. Baron, Chief, Flight Test Division, to Cmdr., HAFB, and Chief of Staff, HADC, subj.: "Flight Test Direction," 17 August 1956; interview, Maj. Kinny by Dr. Bushnell, 19 March 1957; interview, Col. Baron by Dr. Bushnell, 22 April 1957; interview, Capt. Norbert D. LaVally, Chief, Technical Evaluation Air Defense Missile Branch, by Dr. Bushnell, 5 June 1957.

13. Interview, Capt. Drury P. Parks, Administrative Officer, Aero Medical Field Laboratory, by Dr. Bushnell, 30 April 1957.

14. Flight Operations Branch, "Historical Data...1 November-31 December 1955"; Flight Test Division, "Historical Data, 1 April - 30 June 1956."

15. "History of Activities, White Sands Proving Ground 31 December 1952... 30 June 1953," pp. 59-60, citing an interview on 16 March 1953 with the head of the Detachment. The string of successful recovery missions may very well have extended beyond the period covered by the interview.

16. Interview, Eugene E. Crowther, Test Director, Lockheed Aircraft Corporation, by Dr. Bushnell, 2 April 1957.

17. DCS/C, HADC, Stat Brief, 31 December 1956.

18. Interview, Capt. Robert L. Hurd, Chief, Army Aviation Branch, by Dr. Bushnell, 25 April 1957.

19. See Appendix B for the full Agreement.

20. Operations Division, "Historical Data, ... 1 January-31 March 1956."

21. Interview, Capt. Hurd by Dr. Bushnell, 25 April 1957.

22. Cf. Alamogordo Daily News, 15 April 1957.

23. Ltr., Col. Otto R. Haney, DCS/O, to CG, WSPG, subj.: "Army Helicopter Pilots," 29 August 1956.

24. Interview, Capt. Jack H. Patterson, Flying Safety Officer and helicopter pilot, HADC, by Dr. Bushnell, 19 April 1957.

25. Cf. Operations Division, "Historical Data ... 1 July-31 August 1955."

26. Interview, Capt. Hurd by Dr. Bushnell, 25 April 1957; ltr., Col. Clarence L. Elder, DCS/O, to CG, WSPG, subj.: "Aircraft Requirements and Operations of Detachment No. 3, 9393rd Technical Service Unit (Ordnance)," 12 December 1955; DF, Col. Thomas C. Kelly, Cmdr., HAFB, to DCS/O, subj.: "Joint Use Agreement for Maintenance of Army Aircraft," 23 August 1956.

27. See Joint Use Agreement, Appendix C.

28. Interviews, Mr. William Stevens, Aircraft Allocations Officer, DCS/O, by Dr. Bushnell, 25 March and 25 April 1957.

29. DCS/C, Stat Brief, 30 June and 31 July 1954.

30. 3225th Drone Sq., "History ... 1 January to 30 June 1955," p. 21.

31. 3225th Drone Sq., "History ... 1 July to 31 December 1955," p. 3.

32. 2nd ind., Col. George M. Whitenack III, Cmdr., 3225th Drone Sq., to Cmdr., HADC, 30 August 1956, to basic ltr., Hq., WSPG, subj.: "Nike B Night Tracking Mission."

33. DCS/O, HADC, staff study: "Requirements for High Altitude, High Performance Aircraft at HADC," 26 January 1953.

34. Interview, Major William W. Gray, Jr., Capt. Allan H. Hoover, and other Drone Squadron officers and enlisted men, by Dr. Bushnell, 27 March 1957; telephone interview, Col. Dean D. Conard, Cmdr., 3225th Drone Sq., by Dr. Bushnell, 10 May 1957. On the subject of chocolate bars see 3225th Drone Sq., "History ... 1 July to 31 December 1955," p. 17, and for later policy on such matters, TWX, Hq., ARDC, to Hq., HADC, subj.: [Holiday Stunt Flying], 4 October 1956.

35. Interview, Major Gray, Capt. Hoover, et al., by Dr. Bushnell, 27 March 1957; 3225th Drone Sq., "History ... 1 July to 31 December 1955, pp. 21-22, and "History ... 1 January to 30 June 1956," p. 18.

36. Memo of telephone conference, DCS/O, HADC, with Hq., ARDC, subj.: "Aircraft Requirements at HADC," 10 December 1955.

37. Interview, Maj. Gray, Capt. Hoover, et al., by Dr. Bushnell, 27 March 1957. This last procedure is still to be regarded, however, as exceptional. For the basic operating procedure on safety coverage of drone missions, see Appendix D.

38. DCS/C, Stat Brief, 31 May 1955 and 31 December 1956; telephone interview, Col. Conard by Dr. Bushnell, 10 May 1957.

39. 6580th Maintenance and Supply Group, "Historical Data ... 1 May thru 30 June 1953" and "Historical Data ... 1 September thru 30 October 1953." On modification work, cf. 3225th Drone Sq., "History ... 1 January to 30 June 1954," appendix C.

40. 3225th Drone Sq., "History ... 1 July to 31 December 1954," pp. 37-38.

41. Ibid.; DF, Maj. Edwin C. Buchanan, Cmdr., 6580th Field Maintenance Sq., to DCS/O, subj.: "B-50, S/N 111 (Bell)," 9 March 1956; Missile Countermeasures Division, "Historical Data ... 1 October - December 1956." See above, p.9 , for the B-17/F-80 program.

42. See Appendix E for the list made by Aircraft Allocations Branch, Operations Division, DCS/O.

43. Interview, Mr. Crowther by Dr. Bushnell, 2 April 1957.

44. DCS/O staff study: "Report on Aircraft Maintenance Manpower Requirements at HADC," n.d. ; interview, Maj. Kinny by Dr. Bushnell, 19 March 1957.

45. Operations Division, "Historical Data, 1 April 1956 - 30 September 1956;" telephone interview, Mr. John Tillotson, Assistant Chief of Maintenance, 6580th Field Maintenance Sq., by Dr. Bushnell, 24 April 1957.

46. Operations Division, "Historical Data ... 1 October 1956 thru 31 December 1956."

47. Telephone interview, Maj. Kinny by Dr. Bushnell, 19 March 1957.

48. 6580th Maintenance and Supply Group, "Historical Data ... 1 September thru 30 October 1952;" 3225th Drone Sq., "History ... 1 January to 30 June 1953," p. 9; interview, Maj. Gray, Capt. Hoover, et al., by Dr. Bushnell, 27 March 1957; interview, Lt. James M. Shoemaker, Historical Officer, 3225th Drone Sq., by Dr. Bushnell, 20 March 1957.

49. Capt. Jacob J. Quintis, Chief, Operations and Training Branch, Operations Division, DCS/O, "Study on Light and Civil Aircraft Operation at HADC," rough draft as of March 1957.

50. Alamogordo News, 2 September 1954; Quintis, "Study on Light and Civil Aircraft Operation."

51. Interview, Dr. Anthony J. Wilk, Chief, Multisystems Application Branch, Range Instrumentation Development Division, IRM, by Dr. Bushnell, 9 April 1957.

52. Interview, Col. John P. Stapp, Chief, Aero Medical Field Laboratory, HADC, by Dr. Bushnell, 30 April 1957.

53. Operations Division, "Historical Data ... 1 July - 31 August 1955."

54. On two separate occasions in May 1956 a B-47 took off from the Boeing plant in far-away Wichita, Kansas, with a Crossbow missile for actual launching on the Holloman range (GAM-67 Branch, HADC, Test Report 11, 5 June 1956). This appears to set some kind of distance record for a Holloman launch mission, but it is a rather special case since the B-47 was being modified by Boeing prior to assignment (bailed) to Radioplane Company, the Crossbow contractor, at Holloman. Hence the plane was "borrowed" not only to provide needed project data but to demonstrate in actual testing whether the modifications were acceptable.

55. Ltr., Col. Haney to Cmdr., AFFTC, subj.: "B-57 Aircraft Support," 24 April 1956.

56. HADC Reference Book, passim.

57. Flight Test Division, "Historical Data ... 1 October - 31 December 1956."

58. Operations and Plans Division, Dir. of Aircraft Missile Test, "Historical Data ... 1 January - 31 March 1957; Operations and Plans Division, Daily Range Schedule, March 1957; draft of citation honoring Maj. Freddy L. Steadman, Aircraft Maintenance Officer, prepared in Inspector General's Office, HADC, May 1957.

59. Lt. Col. Anthony J. Mony, Operations Research Office, "Report on Air Support Operations," 1955, p. 2.

60. Operations and Plans Division, "Historical Data ... 1 July - 30 September 1956;" telephone interview, Mr. Ralph Kron, Frequency Coordinator, Operations and Plans Division, by Dr. Bushnell, 19 June 1957.

61. Interview, Maj. Gray, Capt. Hoover, et al., by Dr. Bushnell, 27 March 1957.

62. Data cards in Real Estate Section, Installations Division.

63. Cf. ltr., Col. Don R. Ostrander, Cmdr., HADC, to Lt. Gen. Earle E. Partridge, Cmdr., ARDC, subj.: [Monthly Report on Activities], 20 November 1952, mentioning the need for extra safety precautions in drone operations.

64. History of Holloman Air Development Center, 1 January 1953 - 30 June 1953, p. 32.

65. See Appendix F for a summary of air support requirements by projects.

66. DCS/C, Stat Brief, passim; MX 776 Project, HADC, "Monthly Historical Report, August 1954." The latter indicates that the first B-47 bailed to Bell arrived in August 1954--whereas Stat Brief does not begin to list it until the next February. This illustrates the difficulty of finding reliable data on bailed aircraft.

67. Ltr., Col. Richard C. Gibson, DCS/O, to Cmdr., ARDC, subj.: "Support Problems for B-57 Aircraft," 22 October 1956. This letter is reproduced as Appendix G.

68. Lt. Col. Mony, "Report on Air Support Operations," Tab K; list of bailed aircraft, in Appendix E to this volume. The Convair F-102's technically are not bailed but rather "conditionally accepted" by the Air Force and turned over to the company to be used and maintained as if bailed. (Telephone interview, Mr. Lawrence V. Overell, Contract

Specialist, Alamogordo Air Procurement Office, by Dr. Bushnell, 18 June 1957.) Similar arrangements have been made in other cases too, but available data give no indication.

69. Holloman Air Development Center, Semiannual History 1 July - 31 December 1954, p. 75.

70. Ltr., Col. Haney to Cmdr., ARDC, subj.: "Request for Aircraft," 26 January 1956.

71. Lt. Col. Mony, "Report on Air Support Operations," Tab K; ltr., Col. Gibson to Cmdr., ARDC, subj.: "F-100C Aircraft Support for Pogo-Lo Target Development," 3 October 1956, with 2nd ind., Col. Gibson to CO, U. S. Naval Ordnance Missile Test Facility, WSPG, 26 October 1956; interview, Maj. Kinny by Dr. Bushnell, 19 March 1957.

72. Falcon Branch, "Historical Data ... 1 July - 30 September 1956" and "Historical Data ... 1 October - 31 December 1956;" interview, Major Kinny by Dr. Bushnell, 19 March 1957.

73. F-101 Branch, "Historical Data ... 1 January - 31 March 1957," appendix "Falcon Kill Probability;" interview, Capt. Harley L. Grimm, Chief, F-101 Branch, by Dr. Bushnell, 10 May 1957.

74. ARDC Reference Book, passim; telecon with Hq., ARDC, subj.: "Aircraft Requirements at HADC," 10 December 1955.

75. DCS/O, HADC Aircraft Requirements, Two & One Half Year Forecast, 1 July 1956, p. E 55; interview, Capt. Patterson by Dr. Bushnell, 7 May 1956.

76. Major Raymond C. Latham, Acting Chief, Flying Safety Branch, Hq., ARDC, "Staff Visit Report [on HADC], 8-16 May 1956."

77. Ibid.; DF, Col. Haney to Lt. Col. Louis W. Tribbett, Chief, Missile Test Stand Division, subj.: "Report on Camera Modification, F-100 Aircraft," 13 July 1956; Documentary Photographic Branch, "Historical Data ... 1 October - 31 December 1956."

78. Interview, Maj. Kinny by Dr. Bushnell, 19 March 1957;

interview, Mr. Crowther by Dr. Bushnell, 2 April 1957; interview, Mr. Edward E. Rich, Optical Physicist, Hughes Research and Development Laboratories, and other Hughes personnel, by Dr. Bushnell, 3 April 1957.

79. Ltr., Col. Gibson to Cmdr., ARDC, subj.: "Request for F-104B Type Aircraft," 31 January 1957; memo for record, Capt. Arthur G. Miller, Staff Maintenance Officer, DCS/M, subj.: [F-104 Maintenance], 1 April 1957.

80. Ltr., Col. Elder to Cmdr., ARDC, subj.: "HADC Projected Aircraft Inventory," 4 October 1955; interviews, Capt. Druey Parks, Administrative Officer, Aero Medical Field Laboratory, by Dr. Bushnell, 30 April and 16 May 1957; interview, Maj. David G. Simons, Chief, Space Biology Laboratory, by Dr. Bushnell, 14 May 1957.

81. Ltr., Col. Gibson to Cmdr., ARDC, subj.: "Justification and Request for H-21 Type Aircraft," 19 October 1956; interview, Maj. Simons by Dr. Bushnell, 14 May 1957; DF, Col. Gibson to Gen. Davis, subj.: "Recommended Action on Aircraft Assignments," 31 October 1956.

82. Interview, Capt. Grover J. Schack, Project Officer, Sub-gravity Studies, by Dr. Bushnell, 30 April 1957.

83. TWX, Col. Gibson to Cmdr., ARDC, subj.: [Request for Permission to Fly Below 500 Feet], 17 January 1957; answering TWX, from Hq., ARDC, 18 January 1957.

84. Interview, Maj. John J. Anderson, Chief, Operations Division, DCS/O, by Dr. Bushnell, 16 May 1956.

85. See Appendix H for the versions of this directive as of 19 December 1956 and 17 May 1957. The latter makes similar exceptions in the case of missions "involving the use of C-131 and T-29 type aircraft;" but, as indicated below, these two types are used primarily for tracking purposes.

86. Project Crossbow, Weekly Test Status Report, 13 December 1954, 21 December 1954 - 3 January 1955.

87. Missile Countermeasures Division, "Historical Data ... 1 July - 30 September 1956"; telephone interview, Mr. A. F. LaPierre, Assistant Chief, Missile Countermeasures Division, by Dr. Bushnell, 3 May 1957; interview, Maj. Anderson by Dr. Bushnell, 3 May 1957.

88. Memo, Maj. Anderson to Col. Elder, subj.: "C-131 Operations," 7 September 1955. Undoubtedly the problem was aggravated by the fact that Holloman had only one VC-47 assigned especially for transportation of high-ranking personnel (ltr., Col. Elder to Cmdr., ARDC, subj.: "HADC Projected Aircraft Inventory," 4 October 1955).

89. A DCS/O directive on this subject is included as Appendix I. Similar terms are laid down in the Flight Test Division's Standard Operating Procedure 26, subj.: "Use of C-131 Aircraft," 31 December 1956.

90. DF, Col. Haney to Cmdr., HAFB, subj.: "Operation of C-131," 22 May 1956.

III. FAILURES AND PROBLEM AREAS

As the scale of test operations on the Holloman-White Sands range increased, the number of cases in which Holloman proved unable to deliver air support when requested increased also. For a time, in fact, incidents of non-support appear to have multiplied much faster than the number of missions completed. This last conclusion would be impossible to prove mathematically without an undue expenditure of research manhours, but there was little doubt among the users of air support services, who found ample room for complaint during 1955-56.

There had always been some cases of both non-support and partial support(such as providing one chase plane when two were needed.) A certain number of human and materiel failures will occur in test support flying as in any operation, and not always in time to be remedied before scheduled takeoff. However, about the start of 1955 if not before, such failures began to occur with undue frequency. Brigadier General (now Major General) Leighton I. Davis, Commander of Holloman Air Development Center, wrote that operations

> ...practically ground to a halt on 4 February [1955] for lack of test support aircraft. The two F-80 aircraft assigned to this Center and the four F-86 aircraft are all early models which require excessive maintenance. Missions requiring chase aircraft have doubled within the past year and during this period we've lost one F-86.

General Davis went on to explain that out of eight F-86, F-89, and T-33 aircraft assigned only one was in commission, and that in the previous December and January forty hours of missile tests had been cancelled for lack of chase aircraft. Eighty hours more simply had not been scheduled for the same reason.[1]

In the first three months of 1955 there were seventy-five "incidents" of lack of support, complete or partial.[2] In September and October, according to still another count, around thirty missions were cancelled and thirty not scheduled for lack of chase aircraft,[3] while presumably other missions were flown with partial support that limited their effectiveness. To be sure, cancellation figures and the like must not be taken too literally. The more flying is accomplished, the more chances there are for aircraft malfunctions to develop, and the sooner periodic inspections come due; hence an increase in support rendered may actually lead to more cancellations. Likewise the record may show seven separate, consecutive cancellations for a minor project that flew its mission successfully on the eighth try with no real hardship resulting from the delay.[4] On the other hand, neither does the record show all the times that a project does not even attempt to schedule, knowing the effort would be useless. Certainly the air support problem appeared real enough to the units directly affected, such as Recovery Systems Division, which for fifteen consecutive weeks

had no B-26 drop aircraft available for parachute tests.[5]

The following year, 1956, produced a similar batch of statistics on nonsupport. In July, for instance, Falcon Project scheduled some fifty-eight missions. Of these, eleven were cancelled or aborted primarily because support aircraft (including drones) were unavailable or malfunctioned; twelve were cancelled or aborted because of "project" (bailed) aircraft, and twenty-four for other reasons, in some cases because a project decided the test was not needed. Thus the failures due to support aircraft were roughly one-third as many as the total missions completed. In that same month Rascal Project did not lose a single mission for reasons of air support, but then it had only scheduled six.[6] In August, the number of cancellations for all projects, including those that did not require air support, was 121; of these fourteen were traceable to support aircraft and two to lack of drone support.[7] This presented a more favorable picture than did the Falcon totals for July, but individual units continued having their troubles. In the last quarter of the year Recovery Systems Branch (formerly Division) alone had twenty-three cancellations for lack of "available, suitable, aircraft."[8]

One of the more embarrassing aspects of the air support situation was the fact that under the terms of range integration both Army and Navy suffered along with the Air Force

itself. Spokesmen for the Army's Ordnance Mission, White Sands Proving Ground, were especially unhappy over lack of drone support for Nike missions. This complaint primarily concerned the 3225th Drone Squadron, a tenant unit that otherwise was spared most of the criticism directed against the base air support organization. The Army listed eleven cases in which drone support was "refused" from 9 August to 10 September 1956 and nine more from 11 October to 18 December.[9] It is worth noting that some of these cases involved an apparent misunderstanding, as when the Army charged the Drone Squadron with nonsupport of a mission, while records at Holloman indicate the same mission was cancelled by project orders. In still other cases "cancellations" appear to have been lumped loosely together with missions refused by the Drone Squadron for technical reasons, e.g., because a request was made for a "kill" when the latter was not authorized for the project.[10] Indeed the squadron itself claimed that it was unable to meet only one authorized request for drone support in December, and none in November, and that it repeatedly failed to fly all the missions it was capable of because sufficient requests were not even made.[11] This last remark suggests that drones may well have been ready to go when not needed--and sometimes were not ready when requested.

Instances of misunderstanding were not limited to the operating level, or to drone support missions. In February 1957,

Headquarters, Air Research and Development Command called Holloman to ask whether the Army had been "refused" additional support for Nike, including certain F-94 modifications for tracking purposes; in April a Department of the Army memorandum reached Holloman formally requesting that this support be provided; whereas in fact the support in question had been provided by Holloman since the previous January.[12] But even if the failures of air support were sometimes more apparent than real, the problem still existed.

The Navy at White Sands also had its complaints, although it was better satisfied with the work of the Drone Squadron[13] and reserved its fire chiefly for Holloman's failures to come through on Pogo-Lo-type target drops. From 15 July to mid-September 1956 the Navy requested high-altitude drops from F-100 aircraft thirty-four times, but only eight times could a mission actually be scheduled, and only once was it successfully completed.[14] A curious and especially exasperating case occurred on 20 December, when a Pogo drop was originally scheduled with an F-94, the F-94 proved unavailable, and an F-100 turned up instead. Fortunately the Navy was prepared for such an eventuality, having sent the necessary equipment to be used with either plane. Two F-100 Pogo packages were duly mounted, one being a spare; just before takeoff a parabomb for the Hughes Falcon project was substituted for the spare

Pogo package; the remaining Pogo failed to work after the plane reached launch altitude; and with the spare taken off to make way for a Hughes parabomb (which in the end was not launched after all) the day ended in total failure.[15]

The Navy was also critical at times over what it considered excessive caution on the part of Holloman in flying through, over and around an overcast. Fortunately, the recent modification of the Flight Test Division's Standard Operating Procedure on this subject(above, p. 61) promises to reduce Navy complaints.[16] With some exceptions, moreover, both Army and Navy spokesmen have recognized that Holloman was providing the same quality of air support, good or bad, for all three services, and was not discriminating against their projects in favor of its own.[17] The records of range operations bear out this conclusion. In November 1956, for instance, 72% of the missions scheduled by Navy and Air Force reached the range, and 80% of Army missions; for December 65% of the Navy and Air Force missions reached the range, and 69% of Army missions.[18] The fact that 100% did not reach the range was naturally due to much more than simply deficiencies of air support. However, the latter were to blame often enough. The Operations and Plans Division of Holloman's Directorate of Aircraft Missile Test at the end of 1956 not only admitted that the support aircraft situation was unsatisfactory but suggested that the one hope

for improvement in the "near future" was for mission contractor companies to "fly their own support, i.e., photo chase."[19]

Aircraft Allocations

Superficially, much of the trouble could be traced to lack of sufficient aircraft at Holloman. Missions were repeatedly cancelled, or refused for scheduling, because the base inventory lacked a specific aircraft type--for example, a B-57 for certain high-altitude parachute drops that could not be accomplished by F-100.[20] Most of the borrowing of aircraft from other installations was due to the same cause, and, as pointed out in the preceding chapter, this procedure was not wholly satisfactory. Even when a needed aircraft type was represented at Holloman, there were not always enough for backup purposes, and instances of non-support, or merely inadequate support, naturally resulted. The Aero Medical Field Laboratory's chimpanzees had a valid requirement for C-131 travel, with its air-conditioned comfort to protect their physical and mental well-being prior to important research tests; but for lack of enough C-131's they had to settle for a C-47.[21] Aero Medical officers also pleaded for an F-94C to be assigned exclusively for their subgravity studies, noting that many missions had been cancelled because aircraft modified for this purpose incurred a need for maintenance while flying for other projects. But again there were not enough

to go around, and the request was turned down.[22] Indeed almost any project would prefer not to share its support aircraft with anyone else, but with the increase in support requirements this has become almost impossible to arrange save through the technique of bailment to contractors.

According to standards set by higher headquarters, Holloman actually needed no less than seventy-two assigned aircraft as of October 1956, if the Center was to meet its air support obligations. This was roughly two-thirds more than the Center possessed.[23] By the following March the number theoretically required had grown to eighty-one, but the number assigned had not increased.[24] Since Holloman lacked a high Air Force priority in obtaining aircraft, it was doubtful that allocations would ever equal requirements. When new planes did come to Holloman, they commonly arrived later than promised. And they were often second-choice types, or "off" models of a desired type--in extreme cases "junk," as expressed by Lieutenant Colonel Oakley W. Baron, Chief of the Flight Test Division--so that other types and models might be reserved for tactical Air Force units.[25]

Although aircraft use rates at Holloman are not exceptionally high, there was little chance of increasing them appreciably and thus getting more work out of the assigned inventory. Test support planes are inevitably kept idle during many of the

day-time duty hours as a result of project delays and preparations. Opportunities for night and weekend missions are also limited, except in the case of training and administrative flights that would simply hasten the arrival of inspections and malfunctions and would thus tend to lessen the availability of the aircraft for mission flying.[26]

The lack of sufficient aircraft made it necessary to ration flying hours among both Holloman and White Sands activities. It was thus unfortunate that the Flight Test Division, by general agreement, came under poor management at the very time in late 1955 and start of 1956 when the scale of operations was hitting its peak and late-model aircraft were arriving to support more advanced test programs. A special problem, as stated by Operations Policy Guidance Number 1, issued 3 January 1956, was the "continuing history of instances in which test and test support aircraft have been dispatched on cross country flights resulting in cancellation of missions." Command headquarters consequently advised that such flights made with a test-support coded jet would be reason enough to transfer the plane away from Holloman. Nor were jets the only planes involved, as the C-131 troubles described in the previous chapter will indicate. However, this situation was soon remedied, in large part, by a reorganization of the Division. Colonel Baron, who assumed control in February 1956, was a

higher-ranking officer than any of his three immediate predecessors, and in addition was given two majors as assistants. Quite apart from the experience and ability of the officers in question, this imposing array of rank was in itself of considerable help in warding off requests for improper use of primary mission aircraft.[27]

Aircraft Maintenance and Related Problems

As a matter of fact, more aircraft could have been obtained for Holloman without much difficulty, even if not the exact number and types desired. However, the Center would not have wanted to receive the planes that conceivably might have been made available, nor would higher headquarters make them available, so long as the base maintenance capability remained inadequate to take care of them. Maintenance was, in fact, a more basic problem area than aircraft allocations, at least from the standpoint of the base-assigned inventory. The Army recovery service by comparison appears to have had rather few maintenance problems. The Drone Squadron was also relatively well off, having generally fewer types to maintain in proportion to total aircraft, no late models, and a large stock of familiar, trusty B-17's. Drone modifications and repairs were still a major undertaking, but responsibility for the more difficult jobs was shared with the base maintenance shops.[28]

In the early 1950's maintenance had not been a serious problem area even for base-assigned aircraft. At that time each plane generally supported fewer projects, use rates were lower, and in-commission rates (the normal standard for judging maintenance effectiveness) were correspondingly higher. In fiscal 1952 the overall in-commission rate was not quite 70%, a very satisfactory figure.[29] Subsequently the rate fell, although the decline was mostly gradual if one considers only year-around averages: in fiscal 1956 the rate was 60% for test and 64% for non-test aircraft.[30] However, such average figures can be deceptive. In a single month the in-commission rate might still fall below 50%, as it did, say, in September 1955 for test support aircraft;[31] while in the month of August 1956 an all-time low was reached of 36.2% for test support and 24.1% for non-test aircraft.[32] What is more, it did no good for a plane to be in commission during non-duty hours, or between scheduled missions, however much that might help the statistical ratings. What the test program required was for planes to be in flyable status at the very moment they were needed for a mission, and all too often this was not being accomplished.

Also serious was the fact that the planes most critically needed were sometimes the very ones most frequently out of commission. During the first ten months of 1955 in-commission time for piston aircraft varied between 72% and 80%, whereas

for jets it varied from 72% down to 32%. Within the jet field itself there were further variations, with the T-33 making a generally good showing and later-model jets a poor one; periodic inspections on the F-89B were then averaging seven weeks! This last figure was a little unusual, but it was only natural for newer, less familiar planes to take longer in inspection. The newer types were also plagued with more frequent modifications, by and large, and it took longer to build up adequate base stocks of parts and supplies.[33] The worst problems of all were posed by the arrival of the F-100, early in 1955, which was destined to become Holloman's number one maintenance headache. The F-100 was the first supersonic type at Holloman, and one that gave trouble at other bases, too, when first introduced. The fact that Holloman received a sizeable contingent of F-100A's, which were even harder to maintain than other models, did not help matters. A final complication was that the F-100 had been selected as the basic chase type at Holloman and therefore had a relatively high use rate. Early in 1957 the average F-100C was flying three test missions a day when in commission--and thus went out of commission all the more often.[34]

Poor in-commission rates at Holloman have often been blamed on the supposedly excessive number of aircraft types in the base inventory. However, this can be accepted only within certain narrow limits. The number of types is no doubt greater, in proportion to total aircraft on hand, than in a tactical or strategic bombing unit, but it is definitely less than at some other Centers in Air Research and Development Command.[35] A slightly better excuse might be found in the nature of the flying accomplished. With certain exceptions, aircraft use rates are not especially high, but a large amount of flying is of the stop-and-go variety or short test missions, which means that aircraft get more wear and tear per flying hour.[36] However, the exact importance of a factor such as this is almost impossible to measure.

A factor that is simpler to isolate, and has varied greatly in importance over the years, is lack of parts. The percentage of test aircraft awaiting parts--i.e., conventional "AOCP" plus the relatively minor category of Aircraft Not Fully Equipped because of Initial Shortage (ANFE/IS)--was 3.0 in July 1953, 0.2 in September, and then remained at zero for the last quarter of the year. It was slightly higher for non-test aircraft, but this was not as serious. On the other hand, during fiscal 1955 the rate for test aircraft was nearly thirteen--the worst in the entire command. In September 1955

the all-time record was reached of 21.4 for test aircraft.[37] These figures, like so many others, are slightly deceptive, if only because maintenance personnel had been labelling some planes out of commission for parts even when they could have been made flyable without the parts in question, or were out of commission for some other, more important reason as well. This procedure allowed Holloman to obtain the best rating in the command for maintenance effectiveness at the same time that it had the worst rating for aircraft awaiting parts, since planes in the latter category were not charged against the maintenance function but rather against supply. Yet the parts situation was not good, and one reason appears to have been precisely a lack of cooperation between the maintenance and supply functions at Holloman. Another cause was a recent, sharp increase in flying time, while the fact that Holloman generally had few planes of any one aircraft type meant that the base could not normally keep on hand as full a stock of parts for each type as would have been possible otherwise.[38]

Fortunately, the parts situation was soon brought under control. By April 1956 the rate for test support aircraft was down to 1.7 per cent. One reason for the improvement was the introduction of thrice-weekly, scheduled logistic flights from Holloman to Tinker Air Force Base, seat of the Oklahoma City Air Materiel Area. Other scheduled flights were made to Kelly

Air Force Base, Texas (i.e., San Antonio Air Materiel Area), and to Biggs Air Force Base at El Paso, Texas. The fact that Holloman was not on any regular Air Force logistic supply routes made these flights appear all the more necessary, but unfortunately they went against standing Air Force regulations that prohibited scheduled domestic flights by military aircraft save under very special conditions. For this reason, and also for lack of sufficient C-47's to keep up the service, it was abandoned in mid-1956.[39] The number of planes awaiting parts promptly went up again, although it never approached the level of September 1955. Indeed for all of calendar year 1956 as contrasted with calendar 1955 the percentages of aircraft out of commission for parts (this time not including "AFNE/IS") were 3.4 and 8.5 respectively. This striking improvement reflected greater efficiency in both supply and maintenance, and better cooperation between the two functions. One of the most notable advances has been in preparing for the arrival of new aircraft types. Holloman's performance had once been rather poor in this respect, but in getting ready for the Center's first F-104 the local Supply Squadron abandoned the usual requisitioning routine and directly contacted Edwards Air Force Base, where the plane had been undergoing tests, to find out what parts were most likely to be needed. On the basis of Edwards' experience, Holloman then put in a generous lump

order for some 2000 items, which were on hand several weeks before the arrival of the aircraft itself. Base Supply was admittedly overstocked in some respects, but this was better than having the plane out of commission, especially when there would be more F-104's coming along later to use up any excess.[40]

By and large the most critical maintenance problem at Holloman has not been parts but rather the shortage of maintenance manpower. This shortage has been severe only intermittently in the case of tenant units, and back in October 1954 the base maintenance organization led the entire command in number of maintenance people per aircraft possessed. There were slightly over ten per aircraft. Yet even then the backload of work in the base maintenance shops was causing concern, and since that time the aircraft inventory has increased by one-third while the number of maintenance people has inched up far more slowly. By February 1955 Holloman had the lowest ratio of maintenance people to aircraft in the command, with eight per aircraft; in April 1956 Holloman was still lowest with only six per aircraft. The fact that many of the newly-arrived planes were complex, high-performance models made matters worse.[41]

The shortage of manpower spaces was admitted and deplored at command headquarters, but little was done about it. Usually new manpower spaces were assigned after, rather than before, a

new plane, if any additional spaces were assigned at all. The people to fill them came later still, were likely to be specialists in the wrong skills, and then might be ordered overseas just as soon as they were retrained.[42] One interesting case occurred following the assignment to Holloman of a role in Project Sidewinder. The Directorate of Manpower and Organization of Air Research and Development Command explained late in 1955 that the resulting aircraft maintenance requirements should be met by diverting three officer and forty-one airman spaces out of a group of sixty-two spaces that were to become available to Holloman as of April 1956. General Davis promptly wrote back that these sixty-two spaces had been granted earlier on the recommendation of a review team from command headquarters that found a valid need for 115 more spaces simply to handle the current workload, with no Sidewinder included. To which command headquarters replied in turn that Holloman must use the three officers and forty-one airmen as indicated, diverting them "at the expense" of other (unspecified) activities.[43]

The command was not being arbitrary in its treatment of Holloman, but was doing the best it could in the face of command-wide, in fact Air Force-wide, manpower ceilings. Military mechanics were in short supply throughout the armed services, which found it hard to compete with civilian wages and working

conditions; uniformed maintenance people tended to be either beginners serving their apprenticeship or older men approaching retirement. Moreover, Air Research and Development Command had a military maintenance manpower priority of only twenty-second in the Air Force as a whole, on a scale ranging from one to twenty-six.[44] Civilian mechanics were more plentiful, but their hiring was restricted by government manpower ceilings, and their usefulness was limited, up to a point, by inflexible civil service regulations on such matters as overtime work.

The February 1955 reorganization that combined all levels of aircraft maintenance at Holloman in the 6580th Field Maintenance Squadron (above, p.29) was some slight help, in view of the scattered spaces saved by ending unnecessary duplication of services.[45] But this was more than offset by the impact upon the Holloman maintenance function of Project Home Front, the Air Force-wide manpower conversion program launched in September 1955 to replace military with civilians. Command headquarters ordered 152 such conversions in the 6580th Field Maintenance Squadron, which was hard put to find civilian technicians within a reasonable period because of local isolation and similar factors. Even when these difficulties were duly explained to higher echelons, the command agreed to re-establish only eight of the abolished airman spaces.[46] Hence the Center had to struggle merely to hold its own in maintenance

manpower, let alone obtain all the spaces that were needed. To be exact, the Field Maintenance Squadron as of 30 June 1956 had 354 spaces authorized and 409 persons assigned. These totals (which include administrative overhead) contrasted with the figure of 517 people required for maintenance activities if Air Research and Development Command manning standards were to be followed in practice.[47]

The situation was critical enough to call for drastic measures. Accordingly, on 1 August 1956 eleven base aircraft were put in temporary storage on the ground that Holloman was unable to maintain its entire inventory in flyable condition. These aircraft included one F-100, one F-94, two B-26's, three C-45's, two L-20's, one T-33, and one H-19. The F-100 and F-94 categories were cut much less proportionately than the others, since as of 31 July Holloman possessed eleven F-94's--the outgoing basic chase type--and six F-100's--the basic chase plane that was just then being phased in.[48] The cuts were thus designed to interfere as little as possible with the Center mission, and of course the planes were to return to flyable status as soon as practicable. Even so, the cuts were felt. Among other things, this retrenchment temporarily shelved Holloman's plan to establish a military airlift schedule between the main base area and north-range installations, and paved the way for the unsuccessful scheme of Felix Flying Service to meet

the same requirement by means of an exclusive private charter service (above, p. 44).[49] At the same time, despite the optimistic prediction of Lieutenant General Thomas S. Power, head of Air Research and Development Command, that this "expeditious action ... should contribute materially in alleviating your aircraft maintenance problems,"[50] these problems did not cease overnight by any means. At one point in mid-August the jet-aircraft available for mission support consisted of one F-94B.[51] Retrenchment even added one new problem, the considerable drain of manhours required merely to process eleven aircraft into storage. However, by the end of August the overall in-commission rate did show a slight though definite improvement.[52]

The storage policy was really just a beginning. For some time, in fact, officers at Holloman and at command headquarters had been thoroughly convinced that in view of the Center's maintenance difficulties it was essential to reduce the aircraft inventory, and in particular the number of aircraft types. Hence from July 1956 to January 1957 there was a net reduction of nine planes, including all of Holloman's F-86H's, and F-94B's, as well as a lone B-50A. In addition, two out of three B-50D's were lost, as a further step toward excessing all B-50 aircraft. Three new types were added in the same period, but of these the T-29 was basically similar to the C-131's already on base, the B-47 was essentially a replacement for the B-50, and the H-21 was a

replacement for the H-19, which was also slated to be phased out entirely.[53]

The result of these measures was to cut the aircraft inventory well below the total actually needed for mission support. As Colonel Baron put it, "We're operating by the skin of our teeth,"[54] and numerous suggestions were made to the effect that the mission itself should be cut back for want of aircraft maintenance people. During a visit by General Power to Holloman in July 1956 one of his staff observed that this was the only apparent solution,[55] and Holloman was quite willing to explore it further. Colonel Richard C. Gibson, Deputy Chief of Staff for Operations, subsequently outlined a possible "Aircraft Support Austerity Program" that among other things would cancel Project Crossbow and eliminate all drone fighter escort. Later still, a letter signed by General Davis recommended outright the elimination of Rascal Project--which Holloman officials were anxious to abandon on other grounds as well--and redirection and/or reduction of several others as a means of lightening the air support workload.[56]

The campaign to reduce aircraft numbers and types led General Davis to suspend Holloman's earlier request for a VC-54 especially for use of the commanding officer,[57] and it caused a reconsideration of bailment agreements specifying full or partial base maintenance of bailed aircraft. Holloman officials

objected to the action of Air Materiel Command in extending the 75% base-maintenance clause in Lockheed's B-29 bailment contract "without ascertaining our present maintenance capability," and also in bailing a C-45 to the Martin Company for use on the Army's Lacrosse Project at White Sands. In the latter case, as it finally turned out, the plane was not technically bailed but rather loaned to the Army for use by Martin; even so, Holloman was expected to provide maintenance, at the same time as the Center was grounding and then excessing all three of its own C-45's. However, Holloman protests did have some effect: in the end arrangements were made for maintenance by Martin employees, with "very limited field maintenance support" from Holloman.[58] Similarly Lockheed, which had been using B-50's as well as B-29's with partial base maintenance, began building up its own maintenance capabilities in preparation for the day when Holloman would finally succeed in divesting itself of responsibility for either type.[59]

Fortunately, the measures adopted or considered for improving the maintenance situation were not solely designed to cut back Center activities. Impelled in part, at least, by the sudden storage of eleven aircraft on 1 August, command headquarters granted the first substantial increase in maintenance manpower spaces since the shortage became critical. In September 1956 six additional airman spaces were granted outright by the command,

and eighty-four more were provided indirectly from Home Front conversions--i.e., new civilian spaces were created to replace eighty-four airmen elsewhere at Holloman, releasing that number of military spaces for maintenance activity. Thanks to these and other changes, including reshuffling of local resources, the total spaces authorized in the Field Maintenance Squadron rose from 354 in June 1956 to 487 in January 1957, and the persons actually assigned from 409 to 466. These figures indicate, to be sure, that assignments did not keep pace with authorizations. Nor were the latter sufficient even now according to command manning standards.[60]

Command headquarters had hoped at first to make still more spaces available.[61] However, this hope was soon abandoned, and instead command headquarters urged Holloman more and more forcefully to consider contract maintenance as a way out.[62] The suggestion appeared attractive at first glance, since funds with which to pay a private contractor were readily obtainable while funds and manpower to do the same job properly with Air Force resources were not. This possibility had been mentioned occasionally by command officials before, and had been the subject of a serious study begun at Holloman late in 1955, when various private parties were invited to prepare rough estimates of what they would charge to provide maintenance on a contractual basis. Six separate estimates were received. Nothing further was done

at the time, but on 1 November 1956. General Davis did request authority, in general terms, to "employ contractual services of one qualified firm to perform pre-flight, post-flight, periodic and field maintenance, exclusive of shop support ... on all assigned aircraft and subsequent gradual integration of test aircraft [i.e., including those currently bailed] into this centralized maintenance concept."[63]

What General Davis had in mind in the last part of this proposal was that bailment to the various mission contractors should be largely discontinued, all aircraft normally flown by Air Force pilots, and all maintained by a single maintenance contractor. The Air Force would thus be relieved of paying for the duplicate maintenance facilities currently operated by different contractor companies; it would also cease paying for contractor pilots who sometimes flew as little as once a week yet collected full pay the year around.[64] Even without the "integration" of bailed aircraft--which could be counted on to arouse considerable opposition among the companies using them--a maintenance contractor would have the advantage of immunity both from levies for overseas service and from sudden hiring freezes of the sort so annoyingly common in Civil Service. Finally, although civilian mechanics were not as scarce at the present time as they had sometimes been earlier, a maintenance contractor (like the contractor companies already

operating at Holloman) would be able to attract more and better-qualified applicants by holding out the possibility of incentive and dislocation pay and other extras that Civil Service could not give.[65]

Unfortunately, all these extras would constitute a major additional expense on aircraft now maintained by the base. It was even taken for granted that this added expense would more than outweigh any savings on other aircraft that might be effected by including them in a "centralized maintenance concept" as proposed by General Davis. Some bailment contractors were now paying aircraft mechanics as much as $10 a day over and above their basic wage scale.[66] A single maintenance contractor, thanks to his monopolistic hiring position, presumably would not pay as much, but he could be expected to offer more than Civil Service, and far more than military wages. He would be easily tempted, like many of the present bailment contractors, to establish a more lavish organization than was really needed and pass the cost along to the government. He would also want a comfortable profit for himself. Cost, therefore, was the main objection raised against contract maintenance. The belief that it was necessary to preserve Air Force technical skills posed still another objection, and it was thus with considerable misgivings that General Davis asked authority to contract for aircraft maintenance in November 1956. Indeed Holloman was

frankly hoping that this would be done only as a last resort; and even after Air Research and Development Command clearly indicated that it would approve any reasonable contractual arrangements, Holloman officials were reluctant to take the final plunge. Colonel Gregorio P. Martinez, Jr., Deputy Chief of Staff for Materiel, was willing to go ahead, but among his fellow officers there were many who basically preferred stalling for time. One compromise proposal was to contract for only the maintenance on newly-assigned aircraft.[67] Such an arrangement did not appeal to command headquarters, although it might conceivably be tied in with still another proposal that was receiving separate study from both Holloman and Air Materiel Command, the final authority on bailed aircraft: namely, to set up a central maintenance pool in the hands of a single contractor for all bailed planes at Holloman, but without necessarily ending the control of the present bailment contractors over them. Such a scheme would affect base-assigned planes only if some were added to the pool by special agreement, but it could save great sums of money for the Air Force, and it was under very serious consideration as of June 1957.[68]

The policy of stalling on contract maintenance was justified, up to a point, by some remarkable signs of improved effectiveness in the 6580th Field Maintenance Squadron, which resulted in turn from a thorough reorganization of that unit

begun back in September 1956. It was generally agreed, in fact, that poor performance in the maintenance area had been due at least in part to poor management and inefficient organization. The vague functional relationship among different sections of the squadron and lack of clearly defined lines of authority meant that workers were being approached for job assignments by several different supervisors and even by outside agencies. They might be pulled off one job before it was finished in order to accomplish another, less important task. The overall result was a certain amount of confusion, which aggravated (and was aggravated by) a related condition of low morale. There were honorable exceptions, yet a standard complaint was that the maintenance organization all too often lacked a sufficient sense of urgency to keep right on working on a plane until it was ready to fly the next day. Not even a full eight-hour day was being turned in according to some accounts, with workers putting up their tools ahead of time for lack of both proper "motivation" and adequate supervision.[69]

The first step toward a radical reform of these conditions was the appointment of Lieutenant Colonel William F. Haizlip, as of 1 September 1956, to command the 6580th Field Maintenance Squadron. This assignment was in addition to Colonel Haizlip's normal duties as Holloman's Inspector General, and was for the express purpose of carrying out a needed reorganization.

Colonel Haizlip sought first and foremost to streamline the arrangement of sections and subsections within the squadron, eliminating duplicate functions in some cases and in others defining with more precision the mission of a particular unit. For instance, periodic inspections were henceforth entrusted to separate docks that were to do nothing else, whereas previously there had been no one section responsible and mechanics might be unpredictably drawn in from almost anywhere to lend a hand. To make sure that his reforms were being effectively carried out, Colonel Haizlip held weekly meetings with both his staff officers and senior non-commissioned officers. In addition, he ordered the first tool crib inventory in four years; and to tie the various units more closely and quickly together, he had a PBX telephone switchboard set up especially for the Field Maintenance Squadron. This last measure allowed instructions to be dispatched without first waiting for an extension of the overburdened base telephone service to become available. A direct line from the new maintenance switchboard to the flight operations building was a further help in giving immediate attention to minor difficulties that developed just before a mission takeoff.[70]

The effect of these and other changes could be seen in the reduction of periodic inspection time from an average of ten or twelve working days to an average of five or six. The overall

in-commission rate rose from 34.2 in August to an acceptable 62.1 in December. Naturally all such improvements were also due in large part to the increase in squadron personnel and reduction of the aircraft inventory; but the work accomplished by Colonel Haizlip was enough to earn him a Commendation Ribbon after he stepped down from command of the squadron on 2 January 1957.[71] There was still much to be done, and fortunately the work of reform did not stop on 2 January. It continued under the new regime of Major Hubert S. Williams as squadron commander and Captain (soon Major) Freddy L. Steadman as Maintenance Control Officer. Periodic inspections were speeded up still further by an improved scheduling system; a Tire Shop was set up in order to have a stock of built-up tires always on hand for all assigned aircraft, cutting the down-time due to delays in repairing tires by about 40 per cent; and the first steps were taken toward obtaining jet engine minor repair and test facilities for the Field Maintenance Squadron. In order to fulfill a long-felt requirement for greater supervision and coordination of the maintenance function at Center staff level, Captain Arthur G. Miller took on the duties of Staff Maintenance Officer, in the office of the Deputy Chief of Staff for Materiel. And the in-commission rate continued to rise, over the December level.[72]

Flying Safety

Closely connected with the rash of maintenance difficulties that beset Holloman was a very poor showing in flying safety. This situation had developed gradually. The accident rate for the entire first half of 1953 was zero, but it rose sharply in the third quarter. In 1954 the accident rate was slightly--and in 1955 very definitely--above that of the command as a whole. Then, in 1956 (with seven reported accidents, all major), the accident rate per 100,000 flying hours was 62.3, giving Holloman undisputed possession of last place in Air Research and Development Command. The rate for "avoidable" accidents only was 26.7. The number of nonreportable "incidents" was exceptionally high, and the need for some radical improvement was thus dramatized in much the same way as the storing of eleven aircraft called attention to the Center's maintenance problem.[73] It should be noted, however, that this poor showing in flying safety was based on flying done by the Center itself rather than by tenant units or mission contractors. Army aviation at Holloman flew roughly the same number of hours as the Center in 1956 with no accident at all; and the 3225th Drone Squadron, though it had some fairly serious trouble when first getting started, has built up a generally excellent record in recent years.[74] To be sure, there is one variety of "accident" affecting the Drone Squadron

that the squadron has no control over and thus cannot properly be charged against its flying safety performance: namely, when a project schedules a near miss in order to save a drone for further use and hits it broadside by mistake.

Some of the accidents, incidents, and related troubles affecting base-assigned aircraft are also due, in part at least, to the peculiar conditions of test operation. In 1953 an F-86 was damaged in flight by the explosion of a violett smoke cannister attached to the plane's wing,[75] while in September 1956 a Holloman H-19 landing on the range beside a missile impact point accidentally inflated the missile parachute, which in turn struck the rotor blades and did serious damage to the plane although not to either pilot or crew.[76] Balloon missions take Holloman aircraft into out-of-the-way and often hazardous locations: much the worst accident of recent years was the crash of an L-20 into an Arizona mountainside killing all three persons aboard, which occurred on a balloon chase in 1955.[77] And certainly the most bizarre accident was on a balloon mission, on 7 December 1956, when another Holloman L-20 collided with an automobile while taking off from a New Mexico highway.[78] And yet the Holloman mission has never been the primary factor in determining the accident rate. There are hazards in other operations too; and at one point it was brought out that in Air Research and Development Command as

a whole "personnel error" in accidents had been far more frequent during combat readiness training than in mission flying.[79] It is also interesting to note that whereas on one occasion a B-50 launch aircraft was seriously damaged by a missile explosion on the ground during pre-launch preparations, some time later a missile attached to an airborne B-50 caught fire prior to launch and the pilot still brought the plane back undamaged, with missile attached.[80] This appears to suggest that many of the special hazards that do exist can be successfully offset by pilot skill--just as the H-19/parachute and L-20/automobile accidents noted above are attributable in considerable part precisely to error in pilot judgment.[81]

The maintenance difficulties already described were naturally another contributing factor. This point was made both by General Davis and by Major Raymond V. Latham, Chief of the Flying Safety Branch at command headquarters; and it was not merely aircraft maintenance that was faulty, since one cause of a rash of blown tires on Holloman aircraft was the littered condition of Holloman runways.[82] Then, too, part of the trouble may have been plain bad luck. It just happened, for instance, that the first two times an F-100 turbine blade broke off it had to be at Holloman; yet a special F-100 survey team from Air Force flying safety headquarters at Norton Air Force Base could find nothing in what Holloman was

doing with its F-100's that would have caused the turbine blade mishaps.[83] Finally, one source of trouble at Holloman was probably a lack of sufficient emphasis placed upon flying safety. There is conceivably some significance in the fact that during July-September 1956, when Holloman was having three major accidents with base-assigned aircraft and untold "incidents," the attendance at flying safety meetings was 61%, apparently the lowest figure on record.[84]

Whatever the precise causes of Holloman's flying safety record, that record was bad enough to call for energetic action. The L-20 and automobile crash above all attracted attention to the problem, not only because the accident was so unusual in itself but also because of the controversy resulting from indications that supervisory error had played a part--i.e., failure to lay down clear instructions in advance for the type of situation that the pilot faced.[85] However, the reaction really started even before this one famous accident. The officer primarily in charge of carrying out needed reforms was Captain Jack H. Patterson, a helicopter pilot, who took over the Flying Safety Office provisionally on 1 October 1956 and permanently from 1 November 1956 until 22 April 1957. And the Center's desire to emphasize flying safety was clearly indicated by an organizational change, as of 20 December 1956, shifting the Flying Safety

Office from Air Base Group to Center staff level. Henceforth it was administratively attached to the Operations Division of the Deputy Chief of Staff for Operations, but with the special privilege of free access at all times to the Deputy Center Commander, Colonel Hubert S. Judy, Jr.[86] The organizational move--which had long been recommended by higher headquarters[87]--was accompanied by a physical move, from the base operations building to Center headquarters. Both moves gave the Flying Safety Officer greater independence in making recommendations and greater prestige for seeing them carried out.

Captain Patterson managed to revitalize the Flight Safety Council, which was required to meet regularly by command regulations but in practice had held its first meeting on 26 July 1956 and then had not met again. It is now meeting every month, with representatives from every unit directly concerned with flying safety problems (such as Hospital, Drone Squadron, Air Installations). Over and above these meetings, General Davis on his own initiative began a series of more or less informal weekly conferences, with higher-ranking officers primarily, to discuss long-range problems influencing flying safety. Captain Patterson also instituted regular meetings with the civilian pilots flying for the mission contractor companies, in order to coordinate

their activities more closely with those of Air Force pilots and to draw on their accumulated experience for the benefit of all flight operations at Holloman.[88]

One amusing--but effective--aspect of the new emphasis on flying safety was the posting of Flying Safety magazine as reading matter in the officers' lavatory at Center headquarters, on the special initiative of Captain Patterson. Another aspect was the introduction of monthly flying safety awards as a means of granting positive recognition to superior flying instead of merely reprimanding deficiencies. Finally, certain additions have been made to base facilities for the sake of increasing flying safety, such as new crash barriers and jet runway overruns. All these measures taken together brought a distinct improvement: in the first five months of 1957 Holloman had not one reportable accident, nor even an "incident," despite a definite increase in flying time.[89] That record was finally spoiled in June; but at least the worst is past.

Pilot Strength

Although pilot strength has never been an air support problem in quite the same way as maintenance and flying safety, with the growth of flight operations in recent years it can no longer be taken for granted. The Air Force Sidewinder program, for instance, which was wholly operated by the Air Force itself and thus used

no contractor pilots, was handicapped by a shortage of project officer pilots who were both qualified to fly century-series jets and qualified to monitor the program as it developed at Holloman and China Lake.[90] Moreover, as of mid-April 1957 the Bomber-Cargo Section of Flight Test Division was left with no assigned duty pilots as compared with an authorized total of seven. This was less serious than the same condition would have been in the Jet Flight Section, as it was easier to recruit bomber-cargo pilots from among the non-duty pilots stationed at Holloman. But with more mission flying requiring jet than non-jet aircraft, the seven jet duty pilots (out of nine then authorized) were distinctly overburdened.[91] On a slightly different level, when a new H-21B was recently assigned to Holloman it was necessary to borrow a crew from Air Force Special Weapons Center to pick it up from Middletown Air Materiel Area, since Holloman was momentarily down to only one helicopter pilot--the same Captain Patterson who was also serving as Flying Safety Officer.[92]

One factor that made it more difficult to take full advantage of pilots present at Holloman, whether duty or non-duty, was inadequate training facilities. In the first quarter of 1957, with one of the Center's two T-33's away for depot inspection and repair, Holloman had a jet pilot to jet trainer ratio of fifty-to-one, as against a desired ratio of ten- or eight-to-one. This was only one example of a shortage of trainer aircraft that

has been a constant source of complaint, while the fact that Holloman possessed only one operator for its two Link trainers made it difficult for pilots to obtain the required amount of instrument training.[93]

There was a direct connection between the maintenance problem from which Holloman had suffered and at least some aspects of the training problem. For instance, the notoriously poor in-commission rate of F-100 aircraft in the early days of that one type at Holloman was an obvious handicap in checking out pilots to fly it.[94] Similarly, although two RF-80C's were promised to Holloman in May 1956 for combat readiness training, they had to be given to another Center instead since Holloman's maintenance difficulties made it doubtful they could be kept in flyable status. Only in the second quarter of 1957, when the maintenance situation was already much improved, were two TF-80's actually delivered for this purpose.[95] There may also have been, conceivably, some connection between the inadequacies of the training program and Holloman's poor flying safety record through the end of 1956. In any case, it is clear that while pilot strength and pilot training never became truly critical at Holloman, there has often been (and there still is) room for improvement.

Administrative Weaknesses

Something has been said already concerning defects in

organization within the various units concerned with air support, and the steps taken to remedy those defects. However, a broader problem area--and one in which remedies are generally harder to find and carry out--is that of poor coordination and/or cooperation among the various units themselves. Many of the loudest complaints over the quality of air support have in fact centered upon the seemingly excessive number of agencies that share responsibilities in this area, and the apparent misunderstandings and failures of communication that occur among them. Such complaints have come from outside observers, including staff visitors from command headquarters,[96] as well as from the users of air support services.

A Navy spokesman at White Sands Proving Ground complains that he must see twelve or more people at Holloman to obtain action on a single request, e.g., for a chaff dispenser on a Drone Squadron B-17. He adds that everyone is anxious to help, and usually in the end a good job is turned out; but he would much prefer to deal with a single agency on all air support matters. One solution is sometimes to go direct to the lower-echelon personnel who will do the actual work, but in such a case higher-echelon feelings may get hurt.[97] An Army range official, in a similar vein, complains that conflicting lists of aircraft in commission have been submitted on the same day to the Air Force scheduling officer at Holloman; that a mission has even been cancelled because the driver of a fuel truck was eating lunch when he should have been

servicing the mission aircraft; and so forth. A certain number of such human errors are inevitable, but the official in question feels they would be less common if a single person possessed final responsibility for all air support operations and had either to assure maximum performance from everyone else or tell the reason why.[98]

Air Force officers at Holloman have also complained of poor coordination. Colonel Baron, head of the Flight Test Division, reports that he has taken off to give photo coverage for the F-102 Project only to discover once he was airborne that the contractor company (Convair) had sent up one of its own pilots to do the same.[99] On another occasion, 30 August 1956, Colonel Baron got ready to fly support on a Falcon mission, sat in the cockpit for twenty minutes past scheduled takeoff, and then was informed that the project [bailed] aircraft "had just landed" from a previous flight. He quite naturally concluded that project and range operations personnel in the Directorate of Aircraft Missile Test must have known in advance that the mission would be delayed and could just as well have told him earlier. In Colonel Baron's words, "Not meeting the scheduled take-offs is a daily habit, but today was the straw that broke the camel's back...."[100] He further implied that the project had not even intended to meet its assigned schedule--a charge heatedly denied by Colonel Leonidas Baker, head of the Directorate of Aircraft Missile Test.

Colonel Baker might also have pointed out that Mission Control, the particular sub-unit of his Directorate's Operations and Plans Office that could have saved Colonel Baron from mounting the cockpit when he did, was currently understaffed.[101]

One of Colonel Baker's favorite suggestions for improving coordination between his own organization and Flight Test Division has been for pilots to become better acquainted with the complexities of the projects for which they fly. He would actually prefer to see Air Force project officers assigned to his Directorate do more of the support flying for their own projects; and, short of this ideal solution, has repeatedly urged the Flight Test Division's duty pilots to pay more attention to pre-mission briefings.

Yet briefings have been another sore point between Division and Directorate. Colonel Baron not only doubts the wisdom of project officers regularly flying support for their own projects, but considers briefings all too often a mere waste of time. Indeed, no one denies that a pilot can sometimes learn all he needs to know without attending, and that it would be physically impossible, for lack of time, for all pilots to attend all briefings. The question is simply where to draw the line, and so far the only thing everyone agrees on is that the present system is unsatisfactory. A third party, Deputy Chief of Staff for Operations Colonel Richard C. Gibson, has aptly described

present pilot briefings as consisting of "numerous individual communications passing out third-hand and incomplete information."[102] The system is especially unsatisfactory when for some reason there is a later change made in the original requirements. In such a case the pilot may well find himself airborne without pressure suit on a mission supposed to exceed 50,000 feet, or otherwise unable to do the job expected.[103]

The occasionally strained relations between Flight Test Division and Directorate of Aircraft Missile Test have their parallels in difficulties that have arisen between Flight Test Division and the 6580th Field Maintenance Squadron, or between Field Maintenance and Base Supply. Even with a sincere desire to cooperate on the part of all concerned, it will be impossible at times to understand one another's problems, and there is no one officer who can hand down a decision binding on everyone save the Center Commander himself, who normally would not be expected to monitor daily operations.

However, some improvements in coordination have been effected over the past year simply by the institution of daily (rather than weekly) mission scheduling, which involves a complete rechecking of everyone's capabilities and intentions just a day before the mission itself, and by the publication of daily mission summary reports, which make it easier to define responsibility for failures. Past experience had shown that constant

pestering to find the cause of mission delays and cancellations is a salutary influence, but this policy has not always been consistently followed through.[104]

For a long-range solution some officials have favored the creation of a single organization at Holloman, paralleling the Integrated Range Mission at White Sands Proving Ground, with final control over all operations directly affecting air support. The head of such an agency would command flight operations, organizational maintenance, mission control, the Air Force role in range scheduling, and possibly also such specialized functions as the preparation and servicing of parachute targets. The Drone Squadron would obviously need liaison representation.[104] There is at present no intention to undertake anything quite so drastic, but a somewhat reduced version of the same scheme has received approval of the Center Commander, General Davis, and will apparently be attempted.

The present plan is to give the Flight Test Division its own organizational maintenance capability for test support aircraft--just as the Air Support Squadron had formerly--and then move it organizationally and physically to Holloman's "West Area" to become a part of the Directorate of Aircraft Missile Test. The combination of these three elements offers certain obvious advantages. Scheduling and briefing problems should be simplified, with duty pilots, project officers, and range

operations people all located close together and belonging to the same Directorate. It will be easier to cross-train Air Force officers in both missile and aircraft specialties, and with organizational maintenance under the same head as flight operations there will be less excuse than ever for misunderstandings as to in-commission status or job priorities. The Field Maintenance Squadron, on its part, can again become basically what its name implies, although it will still perform organizational maintenance for non-test aircraft.[105]

The main disadvantage of the proposed arrangements is that they would be more costly. There would actually be a small saving in aviation fuel, since the "West Area" is closer to the main jet runway and less taxiing would be required, but additional facilities must be provided on the west side of the present airfield, and more personnel will be needed, chiefly in the maintenance area. These drawbacks are enough to insure that implementation of the proposal will be gradual, extending over a year or more. It has not yet even started, pending completion of detailed plans by the Plans and Programs Division of the Deputy Chief of Staff for Operations.[106]

The Present Outlook

Even without the pending move of Flight Test Division, measures already taken have brought a decided improvement in the

air support picture. With few if any exceptions, Army, Navy, and Air Force spokesmen agree that air support, after hitting bottom in the second half of 1956 has been getting steadily better.[107] With range missions and flying time at a high rate, with aircraft maintenance satisfactory or better, and with flying safety distinctly improved thus far in 1957 over the previous year, the number one problem facing the integrated range is no longer air support but range instrumentation.

To be sure, there is still ample room for improvement, and there are likely to be new problems constantly arising. As already noted, Holloman was prepared well in advance for the arrival of its first F-104, but there is no guarantee that the ultimate changeover from F-100 to F-104 or F-101 as basic chase aircraft may not bring a rash of special problems just as did the advent of the F-100. For one thing, both F-104's and F-101's require more maintenance spaces per aircraft than the F-100, and maintenance spaces are still hard to get.[108] Then, too, the first B-52 is tentatively scheduled to start work at Holloman later in the year, and though it would be bailed to a contractor for operation and maintenance, Holloman runways and taxiways must still be improved if it is to operate to best advantage.[109]

The trend toward increasing use of the north end of the integrated range has also compelled Holloman officials to

consider basing at least a few recovery aircraft at uprange airstrips and establishing daily personnel flights to the planned uprange control center, in view of the "enormous loss of valuable technical manpower if slow surface transportation were employed."[110] This is one reason why Holloman welcomed feelers from White Sands on the possibility of the Army reassuming control of Condron Field, for Holloman might then concentrate on improving the auxiliary airstrips uprange.[111] Thought has also been given to ways of increasing the year-round use of the range; with additional runway lighting, radar surveillance, and the like, missions could be flown twenty-four hours a day, without regard to weather. Such measures are out of the question for the moment, because of limited funds and manpower, but they are perfectly feasible, and if adopted would have an obvious impact on the scale of air support operations.

However, the immediate problem is simply to maintain the present level of air support and continue improving its quality little by little. This requires constant attention to all the factors that affect support flying--maintenance, parts supply, flight safety, scheduling, and the rest--since past experience has shown that innumerable things can go wrong in all these areas. As experience has also shown, things sometimes appear to go wrong in all areas at once; and there

obviously is no single cure for all the problems that can befall so complex an operation as Holloman air support. There is in fact no complete cure for any one problem taken separately, so long as human beings remain fallible. Even so, the worst troubles that have occurred can be attributed in large part to the unusually rapid growth in air operations that took place during 1954-56. That Holloman suffered from growing pains in this period was only to be expected, and not merely in air support. By the same token, with growth now proceeding at a somewhat calmer pace, one may confidently expect the worst is over. Certainly the history of air support at Holloman since 1946 is, on the whole, a history of very great and significant service rendered; and if another period of breakneck expansion should come upon Holloman in the future, the lessons of past difficulties may be of some help in keeping the very same failures from occurring again.

NOTES

CHAPTER III

1. Ltr., Brig. (now Maj.) Gen. Leighton I. Davis, Cmdr., HADC, to Cmdr., ARDC, subj.: "Special Report on Test Support Aircraft," 10 February 1955.

2. Lt. Col. Anthony J. Mony, Operations Research Office, HADC, "Report on Air Support Operations," 1955, p. 2, Tab B.

3. DCS/O, Operations Division, "Historical Data ... 1 September 1955 through 31 October 1955."

4. Cf. memo, Maj. John J. Anderson, Chief, Operations Division, to DCS/O, subj.: "Operations Research Report," n.d. but about October 1955.

5. Recovery Systems Division, HADC, "Semi-annual Progress Report," 9 January 1956.

6. Ltr., Col. Richard C. Gibson, DCS/O, HADC, to Cmdr., ARDC, subj: "Aircraft Maintenance Problems at HADC," 9 November 1956, incl. 3.

7. Ltr., Gen. Davis to Cmdr., ARDC, subj.: "Contractual Services for Aircraft Maintenance," 1 November 1956, incl. 3.

8. Recovery Systems Branch, HADC, "Historical Data ... 1 October - 31 December 1956."

9. Ltrs., Lt. Col. James P. Hamill, Chief, Ordnance Mission, WSPG, to Cmdr., HADC, subj.: "Non-availability of Drone Support," 10 September 1956 and 4 March 1957. Yet the same Drone Squadron received nothing but praise from Dr. Anthony J. Wilk, an Army technician representing the Range Instrumentation Development Division of Integrated Range Mission. He regretted there were not more drones, to supply tracking missions of the various types needed by his organization, but stressed the consistently high quality of service received (interview, Dr. Wilk by Dr. David Bushnell, HADC Historian, 9 April 1957).

10. 1st ind. by Col. Gibson, to basic ltr., Col. Hamill to Cmdr., HADC, subj.: "Nonavailability of Drone Support," 19 October 1956.

11. DFs, Maj. James E. Knight, Operations Officer, 3225th Drone Sq., to Maj. Anderson, subj.: "Drone Support," 7 December 1956 and 3 January 1957; 1st ind., Hq., HADC, to CG, WSPG, to basic ltr., Col. Hamill to Cmdr., HADC, subj.: "Nonavailability of Drone Support," 10 September 1956; DF, Col. Gibson to Dir. of Aircraft Missile Test, subj.: "Drone Support," 1 November 1956.

12. Operations Division, "Historical Data ... 1 January 1957 through 31 March 1957." Persons in the Nike project office at White Sands had no idea why such confusion should have existed at higher echelons.

13. Interview, Mr. G. Harry Stine, General Engineer, NOMTF, WSPG, by Dr. Bushnell, 26 March 1957; interview, Cmdr. T. C. Buell, Executive Officer, NOMTF, WSPG, by Dr. Bushnell, 29 April 1957. Commander Buell did observe (probably with slight exaggeration) that drones were "always late," but this was not the primary air support problem in his opinion.

14. Memo, Cmdr. Buell to Lt. Col. Wilbur D. Pritchard, Deputy for AF, IRM, WSPG, subj.: [Air Support], 17 September 1956.

15. Memo, Mr. Stewart Bean to Cmdr. Buell, subj.: "Pogo Low Aircraft Scheduling Difficulties 12/21/56," 21 December 1956.

16. Interviews, Mr. Stine by Dr. Bushnell, 19 and 26 March, 20 April 1957.

17. Interview, Mr. F. D. Moore, Chief, Range Facilities Control Office, WSPG, by Dr. Bushnell, 21 March 1957; interview, Mr. Samuel R. Cooper, Chief, Scheduling Section, Systems Test Division, WSPG, by Dr. Bushnell, 20 April 1957; and interviews with other WSPG personnel cited above.

18. Memo, Col. B. R. Inczak, Chief, IRM, WSPG, subj.: "Summarized Operations Log of the IRM for the Month of December 1956," 7 January 1957.

19. Operations and Plans Division, Dir. of Aircraft Missile Test, "Historical Data ... 1 October - 31 December 1956."

20. Operations Division, "Historical Data ... 1 January 1957 through 31 March 1957."

21. Interview, Maj. David G. Simons, Chief, HADC Space Biology Laboratory, 4 May 1957.

22. DF, Col. John P. Stapp, Chief, Aero Medical Field Laboratory, to Col. Thomas C. Kelly, Cmdr., HAFB, subj.: "Request for Aircraft," 25 January 1957, and Comment 2 to the same by Col. Gibson, 5 February 1957.

23. 2nd ind., Col. Gibson to CO, NOMTF, WSPG, 26 October 1956, to basic ltr., Col. Gibson to Cmdr., ARDC, subj.: "F-100C Aircraft Support for Pogo-Lo Target Development," 2 October 1956; ARDC Reference Book, 31 October 1956.

24. Ltr., Gen. Davis to Cmdr., ARDC, subj.: "Reduction of Aircraft Inventory," 4 March 1957.

25. Interview, Lt. Col. Pritchard by Dr. Bushnell, 21 March 1957; interview, Lt. Col. Baron by Dr. Bushnell, 22 April 1957.

26. Ltr., Gen. Davis to Cmdr., ARDC, subj.: "Reduction of the Aircraft Inventory," 4 March 1957.

27. DCS/O, HADC, Operations Policy Guidance Number 1, 3 January 1957; interview, Maj. Archer W. Kinny, Jr., Asst. Dep. Dir. of Aircraft Missile Test, by Dr. Bushnell, 19 March 1957.

28. Interview, Lt. James M. Shoemaker, Historical Officer, 3225th Drone Sq., by Dr. Bushnell, 20 March 1957.

29. Chart in "C.O. Notebook F.Y. '53," in HADC Historical Archives. The chart does not specify whether both test and non-test aircraft are used as a basis; presumably both categories are used.

30. ARDC Reference Book, passim.

31. HADC Reference Book, 11 June 1956, p. 14.

32. ARDC Reference Book, 31 August 1956.

33. Lt. Col. Mony, "Report on Air Support Operations," p. 2-5, Tab L; ltr., Col. Otto R. Haney, DCS/O, HADC, to Cmdr., ARDC, subj.: "Request for F-100 Type Aircraft," 29 December 1955, Appendix F, subj.: "F-100C Supply Support Requirements."

34. Interview, Lt. Col. Baron by Dr. Bushnell, 22 April 1957; DF, Lt. Col. Baron to Col. Kelly and Col. Gibson in turn, subj.: "F-100 Support," 26 March 1957.

35. See ARDC Reference Book, passim.

36. Interview, Capt. Arthur G. Miller, Staff Maintenance Officer, by Dr. Bushnell, 8 April 1957.

37. HADC Reference Book, passim; ARDC Reference Book, July 1954 to June 1955.

38. Interview, Capt. Robert L. Hardie, Accountable Supply Officer, by Dr. Bushnell, 29 May 1957; HADC Reference Book, December 1954, p. 50; Lt. Col. Mony, "Report on Air Support Operations," p. 6.

39. HADC Reference Book, 11 June 1956, p. 14; ltr., Col. Haney to Cmdr., ARDC, subj.: "Request for Aircraft," 26 January 1956; circular DF, Lt. Eugene A. Prince, Asst. Chief of Transportation, subj.: "Scheduled Domestic Flights by Military Aircraft," 23 April 1956; DF, M/Sgt. James W. Hall, Chief, Priority and Special Projects, 6580th Supply Sq., to HDBV [? identity not certain], subj.: "Justification for Log-Air Feeder Service," 24 April 1956; telephone interview, Capt. Hardie by Dr. Bushnell, 23 April 1957.

40. DF, Base Supply Section to Cmdr., HAFB, subj.: "Accomplishment Record," 4 January 1957; interview, Capt. Hardie by Dr. Bushnell, 29 May 1957.

41. Operations Division, "Report on Aircraft Maintenance Manpower Requirements at HADC," n.d., Tab G; ltr., Col. Clarence L. Elder, DCS/O, HADC, to Cmdr., ARDC, subj.: "Manpower Requirements for Aircraft Field Maintenance," 18 November 1954, and 4th ind. to the same, Col. Elder to Cmdr., ARDC, 16 February 1955.

42. Interview, Maj. John C. May, Chief, M & O Division, HADC, by Dr. Bushnell, 12 April 1957.

43. Ltr., Mr. Harry E. Roberts, Acting Director, Dir. of M & O, ARDC, to Cmdr., HADC, subj.: "HADC Support Requirements for Project Sidewinder," 5 December 1955; 1st ind. to same, Gen. Davis to Cmdr., ARDC, 23 December 1955; interview, Maj. May by Dr. Bushnell, 12 April 1957. See also Appendix J for a list of manpower requests made by HADC.

44. Interview, Capt. Byron F. Knolle, Jr., Chief, GAM-67/Q-4 Branch, 3 April 1957; interview, Lt. Col. Ulysses W. Hess, DCS/P, HADC, 23 April 1957.

45. 4th ind., Col. Elder to Cmdr., ARDC, 16 February 1955.

46. The role of Holloman in Project Home Front, including the impact on maintenance manpower, is treated at length in Book Two of Volume I, History of Holloman Air Development Center, 1 July - 31 December 1956.

47. M & O Division, Tentative Manpower Status Report, 30 June 1956; Operations Division, "Report on Aircraft Maintenance Manpower Requirements," Tab I. The figure given in the text for requirements may not be wholly comparable with the others cited; e.g., it may include certain maintenance spaces existing outside the Field Maintenance Squadron itself. However, such discrepancies would not seriously affect the total picture.

48. Operations Division, "Historical Data ... 1 April through 30 September 1956;" ARDC Reference Book, July 1956.

49. Capt. Jacob J. Quintis, Chief, Operations and Training Branch, Operations Division, "Study on Light and Civil Aircraft Operation at HADC," draft as of March 1957.

50. Ltr., Lt. Gen. Thomas S. Power, Cmdr., ARDC, to Gen. Davis, subj.: [Current HADC Activities], n.d. but about mid-August 1956.

51. DF, Maj. Archer W. Kinny, Jr., Chief, Operations and Plans Divisinn, Dir. of Aircraft Missile Test, to DCS/O, subj.: "Air Support," 22 August 1952.

52. DF Comment 4, Lt. Col. William F. Haislip, Cmdr., 6580th Field Maintenance Sq., to Col. Gregorio P. Martinez, Jr., DCS/M, subj.: "Air Support," 10 September 1956.

53. Operations Division, "Historical Data ... 1 October 1956 through 31 December 1956."

54. Notes taken by Dr. Bushnell, during a conference on aircraft reduction at HADC, 1 March 1957.

55. DF, Col. Kelly to Col. Haney, DCS/O, subj.: "Maintenance Capabilities," 16 July 1956.

56. Ltr., Col. Gibson to Cmdr., ARDC, subj.: "Aircraft Maintenance Problems at HADC," 9 November 1956, incl. 2; ltr., Gen. Davis to Cmdr., ARDC, subj.: "Reduction of the Aircraft Inventory," 4 March 1957.

57. DF, Col. Hubert S. Judy, Jr., Dep. Cmdr., HADC, to DCS/O, subj.: "Commander's VC-54 Aircraft," n.d.

58. Operations Division, "Historical Data ... 1 April 1956 through 30 September 1956," and "Historical Data ... 1 January 1957 through 31 March 1957;" TWX, Cmdr., HADC, to Cmdr., ARDC, subj.: [C-45 Maintenance], November 1956.

59. Interviews, Mr. Eugene E. Crowther, Test Director, Lockheed Aircraft Corporation, by Dr. Bushnell, 2 April and 18 June 1957.

60. DF, Maj. May, to Col. Haney, Chief of Staff, HADC, and Lt. Col. Hess, DCS/P, subj.: "Manpower Authorization for Aircraft Maintenance," 6 September 1956; interview, Maj. May by Dr. Bushnell, 12 April 1957; M & O Division, Tentative Manpower Status Report, 30 June 1956 and 31 January 1957. See also Appendix J.

61. Ltr., Gen. Power to Gen. Davis, subj.: [Current HADC Activities].

62. Cf. 1st ind., Col. Wallace R. Jordan, Chief, Test Operations Division, ARDC, 17 October 1956, to basic ltr., Col. Gibson to Cmdr., ARDC, subj.: "F-100C Aircraft Support for Pogo-Lo Target Development," 3 October 1956.

63. Ltr., Gen. Davis to Cmdr., ARDC, subj.: "Contractual Services for Aircraft Maintenance," 1 November 1956. The contract maintenance possibility was also mentioned in the general letter from General Power to General Davis cited in footnote 50 and elsewhere, above.

64. As General Davis observed in his letter of 1 November, some had a "stable of pilots flying one project only."

65. Interview, Lt. Col. Hess by Dr. Bushnell, 23 April 1957; interview, Capt. Arthur G. Miller, Staff Maintenance Officer, by Dr. Bushnell, 8 April 1957.

66. DF, Capt. Orin V. Pardun, Chief, Alamogordo Air Procurement Office, to Col. Gregorio P. Martinez, Jr., DCS/M, subj.:

"Information Relative to Contractor Bailed Aircraft, HADC," 25 March 1957. It is interesting to note that, according to Captain Pardun, some contractors were rather secretive about the exact amount they paid over and above normal wages.

67. Interview, Col. Martinez by Dr. Bushnell, 8 April 1957; memo, Maj. Anderson to Lt. Col. Kenneth D. Vandayburg, Asst. DCS/O, subj.: [Contract Maintenance], n.d. but about 1 March 1957; other interviews, cited above, dealing with maintenance problems.

68. Notes taken by Dr. Bushnell, at HADC Staff Meeting, 13 June 1956.

69. Cf. memo, Col. W. E. McCullough, Chief, Maintenance Division, Directorate of Materiel, and Col. W. O. Jackson, Jr., Director of Operations, ARDC, to Brig. Gen. K. M. Landon, Deputy Cmdr. for Resources, ARDC, subj.: "Staff Visit Report HADC," n.d. but referring to week of 19 November 1956; interview, Capt. Miller by Dr. Bushnell, 8 April 1957; interview, Lt. Col. William F. Haizlip, Inspector General, HADC, 11 March 1957. Capt. Miller, as a relatively new arrival at Holloman, spoke primarily of conditions existing at the time of interviewing; but the weaknesses he mentioned can usually be projected back, in aggravated form, to the pre-reorganization period.

70. M & O Division, Organization and Functions, 1 June 1956 and subsequent revisions; interview, Lt. Col. Haizlip by Dr. Bushnell, 11 March 1957; memo, Col. McCullough and Col. Jackson to Gen. Landon, subj.: "Staff Visit Report HADC;" 6580th Field Maintenance Sq., "Historical Data ... 1 October 1956 - 31 December 1956."

71. See Appendix K, "Citation to Accompany the Award of the Commendation Ribbon to William F. Haizlip."

72. 6580th Field Maintenance Sq., "Historical Data ... 1 January 1957 - 31 March 1957;" draft of citation honoring Maj. Freddy L. Steadman, prepared in Inspector General's office, HADC, May 1957; interviews, Maj. Hubert S. Williams, Cmdr., 6580th Field Maintenance Sq., by Dr. Bushnell, 13 March and 14 June 1957; interview, Capt. Miller by Dr. Bushnell, 8 April 1957; interview, Mr. Gerald Hanson, Administrative Officer, DCS/M, by Dr.

Bushnell, 18 June 1957.

73. ARDC Reference Book, passim; interview, Lt. Col. Haizlip by Dr. Bushnell, 11 March 1957; interview, Capt. Kenneth E. Harmon, Flying Safety Officer, by Dr. Bushnell, 4 June 1957.

74. Interview, Mr. William A. Stevens, Chief, Aircraft Allocations Branch, Operations Division, DCS/O, by Dr. Bushnell, 25 March 1957; DF, Lt. Col. Frank D. Sharpe, Vice Cmdr., HADC, to Col. Don R. Ostrander, Cmdr., HADC, subj.: "Aircraft Accident Prevention Program," 25 March 1953. On Army Aviation see Chapter 2, above.

75. History of Holloman Air Development Center, 1 June 1953 - 31 December 1953, pp. 33-34.

76. Flight Test Division, "Historical Data...1 July 1956 - 30 September 1956."

77. Flight Operations Branch, "Historical Data ... 1 July 1955 thru 31 October 1955."

78. Flight Test Division, "Historical Data ... 1 October 1956 - 31 December 1956."

79. Flying Safety Division, "Historical Data ... 1 September 1954 thru 31 October 1954."

80. History of Holloman Air Development Center, 1 January 1954 - 30 June 1954, p. 41; Flying Safety Branch, "Historical Data, 1 April 1956 - 30 June 1956.

81. Interview, Lt. Col. Baron by Dr. Bushnell, 22 April 1957.

82. Messageform, Gen. Davis to Cmdr., ARDC, subj.: [Maintenance Problems], n.d.; Maj. Raymond C. Latham, Chief, Flying Safety Branch, ARDC, "Staff Visit Report," referring to period 8-16 May 1956; interview, Capt. Harley L. Grimm, Chief, F-101 Branch, by Dr. Bushnell, 10 May 1957. The major portion of Maj. Latham's report is reproduced as Appendix L.

83. Interview, Captain Jack H. Patterson, Flying Safety Officer, 19 April 1957.

84. Flying Safety Branch, "Historical Data ... 1 July 1956 - 30 September 1956."

85. Flying Safety Office files.

86. Interviews, Capt. Patterson by Dr. Bushnell, 19 April and 11 June 1957; DF, Maj. May to DCS/Comptroller, subj.: "Organizational Reassignment of Flying Safety Function," 19 December 1956.

87. Cf. Maj. Latham, "Staff Visit Report."

88. Interview, Capt. Patterson by Dr. Bushnell, 19 April 1957.

89. Interview, Capt. Patterson by Dr. Bushnell, 19 April 1957; Flight Test Division, "Historical Data ... 1 October 1956 - 31 December 1956," and "Historical Data ... 1 January 1957 - 31 March 1957;" draft of citation honoring Maj. Steadman.

90. Operations Division, "Historical Data ... 1 April 1956 thru 30 September 1956."

91. Interview, Lt. Col. Baron by Dr. Bushnell, 22 April 1957.

92. Operations Division, "Historical Data ... 1 January 1957 thru 31 March 1957."

93. Operations Division, "Historical Data ... 1 January 1957 thru 31 March 1957;" Flight Safety Council, HADC, minutes of meeting, 14 February 1957; telephone interview, Mr. Stephen Milos, Link trainer operator, by Dr. Bushnell, 5 July 1957.

94. "Pilot Training Requirements as a Result of F-100C Assignments," Appendix E to ltr., Col. Haney, DCS/O, to Cmdr., ARDC, subj.: "Request for F-100 Type Aircraft," 29 December 1955.

95. Operations Division, "Historical Data ... 1 January 1957 thru 31 March 1957;" wall chart in Aircraft Allocations Branch, Operations Division.

96. Memo, Col. McCullough and Col. Jackson to Gen. Landon, subj.: "Staff Visit Report HADC."

97. Interview, Cmdr. T. C. Buell, Executive Officer, NOMTF, WSPG, by Dr. Bushnell, 29 April 1957.

98. Interview, Mr. F. D. Moore, Chief, Range Facilities Control Office, WSPG, by Dr. Bushnell, 21 March 1957.

99. DF, Lt. Col. Baron to Maj. Anderson, subj.: "Mission Support," 28 May 1956.

100. DF, Lt. Col. Baron to Col. Leonidas Baker, Director of Aircraft Missile Test, subj.: "Delayed Take-offs," 30 August 1956.

101. Comment 2, by Col. Baker, 10 September 1956, to DF cited in previous footnote; Comment 5 [to a different document], Maj. Anderson to Gen. Davis, subj.: "Recommendation for Definition of Mission Responsibility," 5 September 1956.

102. DF Comment 4, Col. Richard C. Gibson, to Col. Baker and Col. Kelly, subj.: "Mission Briefing," 31 January 1957. Cf. Maj. Anderson's comment cited above and DF, Lt. Col. Baron to Cmdr., HAFB, and Chief of Staff, HADC, subj.: "Flight Test Direction," 17 August 1956.

103. Interview, Mr. Stine by Dr. Bushnell, 26 March 1957; interview, Lt. Col. Baron by Dr. Bushnell, 22 April 1957.

104. Interview, Maj. Kinny by Dr. Bushnell, 19 March 1957; interview, Mr. Moore by Dr. Bushnell, 21 March 1957.

105. Memo, Col. Gibson to Gen. Davis, subj.: "HADC Reorganization," n.d.; Comment 5, Maj. Anderson to Gen. Davis, subj.: "Recommendation for Definition of Mission Responsibility," 5 September 1956; interview, Maj. Kinny by Dr. Bushnell, 24 June 1957.

106. DF, Col. Baker to Gen. Davis, subj.: "Increased Range Effectiveness," 30 August 1956; Operations Division, "Historical Data ... 1 October 1956 thru 31 December 1956" and "Historical Data ... 1 January 1957 thru 31 March 1957."

107. Interview, Mr. Samuel R. Cooper, Chief, Scheduling Section, Systems Test Division, WSPG, by Dr. Bushnell, 29 April 1957; telephone interview, Mr. Stine by Dr. Bushnell, 19 March 1957; Operations and Plans Division, "Historical Data ... 1 January - 31 March 1957."

108. Ltr., Col. Gibson to Cmdr., ARDC, subj.: "Request for F-104B Type Aircraft," 31 January 1957; telephone interview, Mr. John E. Tillotson, Asst. Maintenance Control Officer, by Dr. Bushnell, 8 July 1957.

109. Operations Division, "Historical Data ... 1 October 1956

thru 31 December 1956" and "Historical Data ... 1 January 1957 thru 31 March 1957."

110. Operations Division, "Historical Data ... 1 April 1956 thru 30 September 1956" and Preliminary Staff Study, subj.: [Uprange Operations], 1956.

111. Capt. Jacob J. Quintis, "Study on Light and Civil Aircraft Operation at HADC," March 1957, and interview, by Dr. Bushnell, 2 May 1957.

GLOSSARY

-A-

AACS	Airways and Air Communications Service
AAAF	Alamogordo Army Air Field
AF	Air Force
AFAC	Air Force Armament Center
AFB	Air Force Base
AFFTC	Air Force Flight Test Center
AFMTC	Air Force Missile Test Center
AMC	Air Materiel Command
ANFE/IS	Aircraft not fully equipped/initial shortage
AOCP	Aircraft out of commission for parts
APGC	Air Proving Ground Command
ARDC	Air Research and Development Command
Asst.	Assistant

-C-

CG	Commanding General
Cmdr.	Commander
CO	Commanding Officer

-D-

DCS/C	Deputy Chief of Staff, Comptroller
DCS/M	Deputy Chief of Staff, Materiel
DCS/O	Deputy Chief of Staff, Operations

DCS/P	Deputy Chief of Staff, Personnel
Dep.	Deputy
DF	Disposition Form
Dir.	Director; Directorate
	-G-
GAM	Guided Air Missile
GAR	Guided Air Rocket
	-H-
HADC	Holloman Air Development Center, Holloman Air Force Base, New Mexico
HAFB	Holloman Air Force Base, New Mexico
Hq.	Headquarters
	-I-
Incl.	Inclosure
Ind.	Indorsement
IRM	Integrated Range Mission
	-K-
KAFB	Kirtland Air Force Base, N. Mex.
	-L-
Ltr.	Letter
	-M-
M & O	Manpower and Organization
MTW	Missile Test Wing
	-N-
n.d.	No date

GAZETTEER

Aberdeen Proving Ground	An Army Ordnance Department test installation, about twenty-five miles east of Baltimore, Maryland.
Air Force Armament Center	One of the Centers of the Air Research and Development Command. Located at Eglin Air Force Base, Florida, it is engaged in testing of armament, including fire control systems.
Air Force Flight Test Center	One of the Centers that make up Air Research and Development Command. It is physically located at Edwards Air Force Base, California, and is primarily concerned with the testing of new aircraft types.
Air Force Special Weapons Center	One of the Centers that make up Air Research and Development Command. It is located at Kirtland Air Force Base, Albuquerque, New Mexico, and is the primary Air Force agency for development of atomic weapon systems.
Alamogordo, New Mexico	The closest settlement to Holloman Air Force Base, Alamogordo is located at the edge of the Tularosa Basin, about ten miles to the east of the military installation and ninety miles north of El Paso, Texas. Founded in 1898 as a railroad waterpoint, it grew slowly until after the establishment of the Alamogordo Army Air Field (later renamed Holloman) in 1942. It is the county seat of Otero County and has a current population of about 18,000.

Alamogordo Army Air Field	A military installation ten miles from Alamogordo, which was founded in 1942 as a training station for bomber crews but in 1947 began a new program of guided missile development. At the start of 1948 it was renamed Holloman Air Force Base.
Albrook Air Force Base, Canal Zone	An installation along the Panama Canal which serves as headquarters for the Caribbean Air Command.
Biggs Air Force Base	A Strategic Air Command installation at El Paso, Texas.
China Lake Naval Ordnance Test Station	Naval installation, near Inyokern, California, engaged in missile-testing and other military development projects. Holloman projects have sometimes made use of China Lake test facilities, and China Lake projects have also used the Holloman-White Sands Integrated Range.
Condron Field	Small airfield, under the jurisdiction of Holloman Air Force Base but located in the vicinity of Headquarters, White Sands Proving Ground and principally serving activities at the Proving Ground.
Edwards Air Force Base	Air Research and Development Command installation, approximately seventy-five miles northeast of Los Angeles, California. It is the site of Air Force Flight Test Center.
Eglin Air Force Base	An installation at Valparaiso, Florida, where Headquarters, Air Proving Ground Command is located. The Air Force Armament Center is a tenant unit at the base.

Fort Bliss	An Army installation outside El Paso, Texas, which has direct control over military range land extending into southern New Mexico and joining the land included in the Holloman-White Sands Integrated Range.
Holloman Air Development Center	A major unit of the Air Research and Development Command, formally established in 1952 and located at Holloman Air Force Base, New Mexico. Its mission is chiefly related to guided missiles, upper atmospheric investigations, space biology, and biodynamics.
Holloman Air Force Base	Known until 1948 as Alamogordo Army Air Field, Holloman Air Force Base is located in the Tularosa Basin ten miles southwest of Alamogordo, New Mexico. It is now the location of Holloman Air Development Center.
Holloman-White Sands Integrated Range	A military testing range that occupies a major part of the Tularosa Basin. It was formed in 1952 by combining the range of Holloman Air Force Base with that of White Sands Proving Ground and part of the ranges belonging to Fort Bliss, Texas.
Kelly Air Force Base	A major installation at San Antonio, Texas. It is the site of Headquarters, San Antonio Air Materiel Area.
Langley Field	An installation whose full name is Langley Air Force Base, Hampton, Virginia. It is the site of Headquarters, Tactical Air Command.
Middletown Air Materiel Area	An air materiel area that takes in all the northeastern section

	of the United States. Its headquarters is at Olmsted Air Force Base, Middletown, Pennsylvania.
Norton Air Force Base	An installation at San Bernardino, California, which is the location of Headquarters, San Bernardino Air Materiel Area and Office, Inspector General, United States Air Force. The latter office includes the Air Force's Directorate of Flight Safety Research.
Ogden, Utah	Utah's second largest city, and site of Hill Air Force Base, an Air Materiel Command installation.
Oklahoma City Air Materiel Area	An air materiel area that takes in, basically, the west-central states. Its headquarters is at Tinker Air Force Base, Oklahoma City.
Sacramento Mountains	Range of mountains constituting the eastern border of the Tularosa Basin. Their highest peak, Sierra Blanca, rises over 12,000 feet.
San Antonio Air Material Area	An air materiel area that takes in the states of New Mexico, Texas, and part of Louisiana. Its headquarters is at Kelly Air Force Base, San Antonio, Texas.
Tinker Air Force Base	Installation at Oklahoma City, which contains the headquarters of Oklahoma City Air Materiel Area.
Tularosa Basin	The northern extension of the Chihuahua Desert, this broad, flat basin was formed when the entire region sank some eight or more thousand feet along parallel geological faults running along the present San Andres and Sacramento mountain chains. Within

	this basin are the Fort Bliss, Holloman Air Force Base and White Sands Proving Ground ranges. The flatness of the basin floor, the many convenient instrumentation sites on surrounding peaks, the ideal testing climate and the sparseness of population make the basin unusually valuable for military research and development programs.
West Area	One of the three principal, non-contiguous areas into which Holloman Air Force Base is divided. This three-area arrangement was adopted from the outset, according to specifications of the Royal Air Force, which was originally expected to use the base, in World War II, as a British overseas training installation. The West Area at present is the site of the three mission Directorates of Aircraft Missile Test, Ballistic Missile Test, and Research and Development.
White Sands National Monument	A recreation area, famous for its dunes of pure gypsum, in the middle of the Tularosa Basin. Operated by the National Park Service, it is wholly surrounded by the Holloman-White Sands Integrated Range.
White Sands Proving Ground	A military testing installation in the western part of the Tularosa Basin. Established by the Army in 1945, its facilities are now shared with both Navy and Air Force.
Williams Air Force Base	An Air Training Command installation outside Chandler, Arizona.
Wright Air Development Center	The largest of all the Centers in Air Research and Development

Command, located at Wright-Patterson Air Force Base, Ohio. Its research and monitoring functions touch upon virtually all aspects of the development of weapon systems.

INDEX

APPENDIX A

White Sands Proving Ground Technical Order Number 6, 7 October 1952.

APPENDIX A

White Sands Proving Ground Technical Order Number 6, 7 October 1952.

HEADQUARTERS
WHITE SANDS PROVING GROUND
LAS CRUCES, NEW MEXICO

TECHNICAL OPERATIONS ORDERS
NUMBER 6

7 October 1952

AIR SUPPORT SERVICES

1. Under the provisions of General Order No. 30, Headquarters, White Sands Proving Ground, 22 Sep 52, the Commanding Officer, Holloman Air Force Base, will assume responsibility for the operation of all air fields, aircraft and weather stations required for the integrated operation of the White Sands Proving Ground range; and, further, will assume the responsibility for the provision of such other Air Force services as may be required for guided missiles and aircraft supporting activities for the range.

2. In order for the Commanding Officer, Holloman Air Force Base, to properly assume the above responsibilities, the Commanding General, White Sands Proving Ground, will:

a. Attach all Army pilots, aircraft and aircraft maintenance personnel presently assigned to White Sands Proving Ground to Holloman Air Force Base for duty under the operational control of Commanding Officer, Holloman Air Force Base.

b. Requisition through Army channels, pilot and maintenance personnel required to operate and provide organizational maintenance for army aircraft for integrated operation of the range.

c. Provide (insofar as available through army channels), equip, train and maintain adequate crash fire-fighting and crash rescue equipment at Condron Field as determined by the Commanding Officer, Holloman Air Force Base.

d. Determine requirements and provide justification for aircraft required in support of the integrated range and/or Army and Navy project support.

e. Assist in the maintenance of Condron Field and up-range landing strips on a cross-funding basis.

3. The Commanding Officer, Holloman Air Force Base, will:

a. Operate, maintain and control all aircraft assigned to Holloman Air Force Base for the support of the Holloman Air Force Base mission.

b. Operate, maintain and control all Air Force and Army aircraft assigned for the support of the integrated range and/or Army and Navy project support.

c. Provide base support as required for aircraft and supporting activities of other services for the integrated range.

d. Provide personnel and technical Air Force equipment, except as noted in paragraph 2c above, required to operate Condron Field as an auxiliary air field of Holloman Air Force Base.

e. Determine and provide support facilities requirements for Condron Field and up-range landing strips.

f. Prescribe air traffic control procedures for Holloman Air Force Base, Condron Field and the integrated range.

g. Accomplish the recovery of all crashed aircraft.

h. Provide for the unified handling of weather services as required for the integrated range.

4. Pending completed action to consolidate the White Sands Proving Ground - Holloman Air Force Base weather detachments, the Commanding General, White Sands Proving Ground will attach Detachment 25, Fourth Weather Group, to Holloman Air Force Base for administration and operational control.

5. Army personnel and equipment, both civilian and military, presently assigned to the operation of Condron Field, will be attached for duty and operational control to Holloman Air Force Base until they can be replaced in kind by Air Force personnel and equipment.

DISTRIBUTION: T

J G SHINKLE
Col Ord C
Commanding

APPENDIX B

Joint Use Agreement, Holloman Air Development Center and Detachment III, 9393rd Technical Service Unit, 1 September 1953.

HEADQUARTERS
HOLLOMAN AIR DEVELOPMENT CENTER
Holloman Air Force Base, New Mexico

J O I N T U S E A G R E E M E N T*

I

GENERAL INFORMATION

1. Purpose. The purpose of this agreement is to define the responsibilities and delineate the support to be provided by Holloman Air Development Center to Detachment III, 9393rd Technical Service Unit (Ordnance) during the tenancy of Detachment III, 9393rd Technical Service Unit (Ordnance) upon Holloman Air Force Base.

2. Authority. General Order No. 37, Headquarters, White Sands Proving Ground, 16 October 1952, Subject: Organization of Detachment III, 9393rd Technical Service Unit (Ordnance) and Technical Operations Order No. 6, as amended Headquarters, White Sands Proving Ground, 7 October 1952, Subject: Air Support Services.

II

TERMS OF AGREEMENT

1. General Provisions.

a. Holloman Air Development Center will provide base support and facilities to Detachment III, 9393rd Technical Service Unit (Ordnance) as delineated in the following paragraphs. All facilities so provided will remain the property of the United States Air Force. Any fixed facilities or improvements to fixed facilities which may be provided by Detachment III, 9393rd Technical Service Unit (Ordnance) will become the property of the United States Air Force.

b. No demand will be made upon base personnel beyond that normally required during an eight (8) hour day or forty (40) hour week, except for normal operation of flying facilities, or as may be required for range support.

c. Detachment III, 9393rd Technical Service Unit (Ordnance) will comply with such Holloman Air Force Base Regulations, Policies and Standard Operating Procedures as may be directed by the Commander, Holloman Air Development Center.

* This Agreement supersedes Joint Use Agreement dated November 1952.

2. Administration and Services.

a. Holloman Air Development Center will provide normal administrative and personal services to include such services as Post Exchange, Service Club, Officers' Club, NCO Club, Housing, Communications, Medical, Postal, R & U, Ground Safety, Commissary, etc. Housing will be provided for enlisted men assigned to Detachment III, 9393rd Technical Service Unit (Ordnance). Space as deemed necessary and adequate by the Commander, Holloman Air Development Center, will be initially provided in Hangar No. 3, Building No. 291, for operations and technical services. The Commander, Holloman Air Development Center, reserves the right to transfer the living facilities of personnel assigned to Detachment III, Technical Service Unit (Ordnance) from one building to another and to change the assignment of original space provided for operations and technical services at any time, providing the transfer does not interfere with or alter the assigned mission of Detachment III, Technical Service Unit (Ordnance).

b. Holloman Air Development Center will provide messing facilities on a reimbursable basis under the provisions of AFR 172-8.

c. Detachment III, 9393rd Technical Unit (Ordnance) will be responsible for its own administration, but will be attached to the 6580th Air Base Group for strength accounting purposes.

d. Courts-Martial jurisdiction of personnel assigned to Detachment III, 9393rd Technical Service Unit (Ordnance) will remain with the Commanding General, White Sands Proving Ground.

e. Assignment to "family-quarters" will be made in accordance with Air Force Regulations and HADC Policy.

3. Supply.

a. Non-Expendable Common Supplies and Equipment: Accountability for Air Force equipment will be maintained by Holloman Base Supply Officer. Detachment III, 9393rd Technical Service Unit (Ordnance) will appoint a responsible officer to requisition and be responsible for all Memorandum Receipt Property Issued to Detachment III, 9393rd Technical Service Unit (Ordnance), by Holloman Base Supply Officer.

b. Expendable Supplies. Expendable supplies will be issued on Air Force Form 446 on a reimbursable basis under the provisions of Air Force Manual 67-1.

c. Transportation. Detachment III, 9393rd Technical Service Unit (Ordnance) will provide its own motor transportation.

d. Aircraft Parts. All aircraft parts for Army aircraft will be supplied through Army channels.

e. Automotive Gasoline and Lubricants. Gasoline and lubricants for motor vehicles in the custody of Detachment III, 9393rd Technical Service Unit (Ordnance) will be issued on Air Force Form 446 and/or DA AGO Form 10-113 on a reimbursable basis in accordance with Air Force Manual 67-1.

f. Aviation Lubricants: Lubricants for aircraft of Detachment III, 9393rd Technical Service Unit (Ordnance) will be issued on Air Force Form 446 on a reimbursable basis in accordance with Air Force Manual 67-4.

g. Aviation Fuel: Fuel for aircraft of Detachment III, 9393rd Technical Service Unit (Ordnance), will be provided through Army channels.

4. Maintenance:

a. Vehicle Maintenance. Organizational and field maintenance of assigned motor vehicles will be accomplished by Holloman Air Development Center on a cross-servicing basis.

b. Aircraft Maintenance:

(1) Organizational and field maintenance of assigned aircraft will be accomplished by Detachment III, 9393rd Technical Service Unit (Ordnance), in accordance with provisions of FM 20-100, Chapter 8, Section II, Par 192a(1), and (2). Organizational aircraft maintenance shall include: "That maintenance authorized for, performed by, and the responsibility of a using organization on its own equipment. This maintenance consists normally of inspecting, cleaning, servicing, preserving, lubricating, and adjusting as required and also may consist of minor parts replacement not requiring highly technical skills."

(2) Such assistance as may be required for field maintenance of aircraft assigned Detachment III, 9393rd Technical Service Unit (Ordnance) will be

provided by Holloman Air Development Center on a reimbursable basis. In accordance with the provisions of FM 20-100, Chapter 8, Section 11, par 192a(2), field maintenance shall include: "that maintenance activities in direct support of (a) using organization(s). This category normally will be limited to maintenance consisting of replacement of unserviceable parts, sub-assemblies, or assemblies."

5. Flight Control.

a. The Commander, Holloman Air Development Center, will be the clearance authority for all aircraft (local or cross-country) operating from Holloman Air Force Base and/or Condron Field.

b. The Commander, Holloman Air Development Center, will prescribe the local flying areas for Holloman Air Force Base and Condron Field.

c. The Commander, Holloman Air Development Center will provide all normal Base Operations functions. Detachment III, 9393rd Technical Service Unit (Ordnance) will comply with all Air Force Regulations, Standard Operating Procedures and HADC Regulations pertaining to Flight Operations within the designated traffic control areas of Holloman Air Force Base and Condron Field.

d. Traffic Control Areas.

(1) Holloman Traffic Control Area shall consist of that area within a five (5) mile radius of the center of Holloman Air Force Base.

(2) Condron Traffic Control Area shall consist of that area within a three (3) mile radius of the center of Condron Field.

(3) When operating aircraft outside the designated control areas, Detachment III, 9393rd Technical Service Unit (Ordnance) shall conduct aircraft operations in accordance with Army Flight Regulations and applicable CAA flight rules and regulations.

e. Army Aviation support will be furnished to White Sands Proving Ground and Holloman Air Development Center on the following priority basis:

(1) WSPG Integrated Range missile search and recovery.

(2) WSPG Integrated Range tracking missions.

(3) One-day search and recovery of balloons, parachutes, and other missions which are deemed necessary by the Commander, Holloman Air Development Center. No extended missions lasting more than one day will be flown without prior approval of Commanding General, White Sands Proving Ground.

(4) WSSCA Missions.

(5) Transportation of personnel and/or supplies within the Integrated Range.

(6) Such administrative and training flights as deemed necessary by the Commanding Officer, Detachment III, 9393rd Technical Service Unit.

f. Army aviators, provided they assume full responsibility, may land on Condron Field or boundary roads when personnel are not available for operation of Condron Field, and when such landing is necessitated by circumstances.

g. Detachment III, 9393rd Technical Service Unit (Ordnance) will be responsible for maintaining assigned individual pilot's flight and aircraft maintenance records.

h. Responsibility for aircraft accident investigation and reporting will remain with the Commanding General, White Sands Proving Ground. Commander, Holloman Air Development Center, will provide assistance upon request.

i. Training missions and cross-country flights will be conducted in accordance with Army Regulations, and under authority of the Unit Commander, Detachment III, 9393rd Technical Service Unit.

j. Flying and ground crew personnel assigned to Detachment III, 9393rd Technical Service Unit, will participate in a Unit Flying Safety Program under staff supervision of Holloman Air Force Base Flying Safety Officer.

k. Army pilots assigned Detachment III, 9393rd Technical Service Unit, who possess a valid Army Aviator Rating, may become qualified to pilot Air Force aircraft of equivalent type and horsepower through normal check-out procedures established by Holloman Air Development Center Flight Operations. Pending clarification of pertinent Air Force Regulations pertaining to qualified Army personnel piloting Air Force aircraft of heavier class and higher horsepower, qualified personnel assigned Detachment III, 9393rd Technical Service Unit may be assigned co-pilot duties in Air Force aircraft of heavier class and

higher horsepower than those assigned Army aviation activities. Air Force personnel who possess an aeronautical rating of Pilot, Senior Pilot or Command Pilot may become qualified to perform pilot duties in aircraft assigned Detachment III, 9393rd Technical Service Unit.

1. The Link Trainer located in Building No. 316 will be made available for pilots of Detachment III, 9393rd Technical Service Unit, on a time available basis.

FOR HOLLOMAN AIR DEVELOPMENT CENTER:

Frank D Sharp
FRANK D. SHARP
Colonel, USAF
Deputy Commander

1 Sept 53
(Date)

FOR 9393RD TECHNICAL SERVICE UNIT:

Richard H. Clark
RICHARD H. CLARK
1st Lt., TC

31 Aug 53
(Date)

NOTE: Following distribution made on this Agreement:
Original to HDO for filing
2 copies to Lt Clark, 9393rd TSU
1 copy to Col Sharp's files (HDGV)
1 copy sent to all staff officers, Air Support Sq, and Air Base Group for coordination and return to HDG.

APPENDIX C

Joint Use Agreement, Holloman Air Development Center and Detachment, Utility Squadron 3, 1 December 1952.

HEADQUARTERS
HOLLOMAN AIR DEVELOPMENT CENTER
Holloman Air Force Base, New Mexico

JOINT USE AGREEMENT

1 December 1952

I

GENERAL INFORMATION

1. Purpose: The purpose of this agreement is to define the responsibilities and delineate the support to be provided by Holloman Air Development Center to the Detachment, Utility Squadron 3 (Det VU-3) during the tenancy of Detachment VU-3 at Holloman Air Development Center.

2. Authority: Third Indorsement, HQ AFMTC, 4 Aug 52, to ltr, Dept of the Army, Office of Ass't C/S, G-4, Logistics, 27 May 52, subj: Support of Army Guided Missile Tests at WSPG with Navy F6F-5K Target Drones and General Order #30, HQ, WSPG, 22 Sep 52.

3. Effective Date: This agreement shall become effective on or about 1 Jan 53, and shall remain in effect until terminated in writing by the Commanding Officer, Holloman Air Development Center or the Commanding Officer, Naval Ordnance Missile Test Facility. (NOMTF).

II

TERMS OF AGREEMENT

1. General Provisions.

a. HADC will provide base support and facilities to Detachment, Utility Squadron 3 (Det VU-3) as delineated in the following paragraphs. All facilities so provided will remain the property of the USAF. Any facilities or improvements that may be provided by the Navy which are permanently attached to or integrated with Real Property in such a manner that it cannot be removed without causing substantial physical damage or changing the designed standard or mission of the facility, will become the property of the USAF.

b. No demand will be made upon Center personnel beyond that normally required during an 8-hour day or 40-hour week, except for normal operation of flying facilities or other operational requirements of WSPG.

c. Detachment VU-3 will comply with such HADC regulations and policies as may be directed by the Commanding Officer, Holloman Air Development Center.

2. Administration and Services.

a. Holloman Air Development Cen r will provide normal base administrative and personnel services, to include such services as finance, Post Exchange, Service Club, Officers' Club, housing (except family housing), communications, medical, postal, R & U, ground safety, commissary, Air Police, etc. Housing for enlisted men will be provided in Building T-512, and such other buildings as necessary. Building T-1080 will be provided for operations and technical services.

b. HADC will provide messing facilities on a reimbursable basis as outlined in existing regulations.

c. Detachment VU-3 will be responsible for its own administration.

d. Courts martial jurisdiction of personnel assigned to Detachment VU-3 will remain with the Commanding Officer, MCMTF.

e. Laundry service will be provided by HADC.

f. Assignment to family quarters will be made in accordance with Air Force Regulations and HADC policy.

3. Supply.

a. Non-expendable common supplies and equipment:

Accountability will be maintained by HADC Supply Officer. Detachment VU-3 will appoint a responsible property officer to requisition and be responsible for all memorandum receipt property issued to the detachment.

b. Expendable supplies:

Will be issued on Air Force Form 466 on a reimbursable basis under the provisions of Air Force Manual 67-1.

c. Transportation:

Detachment VU-3 will provide its own motor transportation.

d. Automotive gasoline and lubricants:

Gasoline and lubricants for motor vehicles of Detachment VU-3 will be issued on Air Force Form 466 and/or DA AGO Form 10-118 on a reimbursable basis in accordance with Air Force Manual 67-1.

e. Aviation gasoline and lubricants:

Will be issued on Air Force Form 446 on a reimbursable basis in accordance with AFM 67-4.

4. Maintenance.

a. Vehicle Maintenance:

Organizational maintenance of motor vehicles will be accomplished by the [redacted]. Holloman Air Development Center will provide field maintenance assistance, as required, on a reimbursable basis in accordance with AFM 77-1.

b. Aircraft Maintenance:

Organizational maintenance of assigned aircraft will be accomplished by Detachment VU-3. Such assistance as may be required for field maintenance or aircraft will be provided by Holloman Air Development Center on a reimbursable basis.

5. Flight Control.

a. The Commanding Officer, Holloman Air Development Center, will be the clearing authority for all aircraft, local or cross-country, operating from Holloman Air Development Center and will provide all normal Center operations services. Detachment VU-3 will comply with all AFR's and HADC Regulations and SOP's pertaining to flight operations at HADC.

b. Detachment VU-3 will maintain its own flight records section.

c. Responsibility for aircraft accident investigation and reporting will be conducted in accordance with Naval Air Regulations. This does not preclude Commanding Officer HADC from conducting his own

accident investigation. The Commanding Officer, NOMTF will provide an officer member for the HADC Aircraft Accident Investigating Board if requested.

d. Detachment VU-3 will participate in the HADC Flying Safety Program.

FOR HOLLOMAN AIR DEVELOPMENT CENTER:

DON R. OSTRANDER
Colonel, USAF
Commanding

FOR THE NAVAL ORDNANCE MISSILE TEST FACILITY:

P. D. QUIRK
Captain, USN
Commanding

APPENDIX D

DCS/Operations Policy Guidance Number 3, 4 April 1956.

HEADQUARTERS
HOLLOMAN AIR DEVELOPMENT CENTER
Holloman Air Force Base
New Mexico

DCS/Operations Policy Guidance
Number 3

4 April 1956

SUBJECT: Armed Fighter Safety for Flights of Operational Drone Type Aircraft

PURPOSE:

1. This guidance is to confirm agreements between White Sands Proving Ground and Holloman Air Development Center. The Commander, HADC assumes responsibility for safety in the operation of all drones used for operational purposes. Those drones in an R&D or experimental stage are not considered under this regulation. Q2A's are specifically exempt from this regulation since no armed chase is required.

GUIDANCE:

1. Normal method of operation (ie. when sufficient armed safety aircraft are available).

a. Airborne armed safety escort is not required for any Nullo operated in the Holloman Air Force Base control zone. The HAFB control zone is that air space below 5500 MSL and within a radius of 3 miles of the center of the flying field.

b. Airborne armed safety escort is not required during QB-17 drone climb to or descent from altitude, as long as the drone directors control is functioning normally. An armed safety escort is required on stand-by status on the ground during normal QB-17 drone climb to and descent from altitude. The fighter will be capable of taking off within two (2) minutes after a scramble notification from the Air Force Mission Controller.

c. Airborne armed safety escort is required for all QF-80 flights outside the HAFB control zone. Normally the fighter will be positioned close to the director aircraft.

d. Airborne armed safety escort is required for all hot runs. Vectoring the fighter to the drone director is the responsibility of the drone radar controller. Positioning the fighter for safety purposes or for attack position will be the responsibility of the drone radar controller. A drone crippled by a hit or partially unmanageable will require the fighter in an attack position.

e. In the event the director loses complete control of the drone, the Drone Squadron electronic post Commander "Hot Point" will advise the Air Force Mission Controller. At that time safety responsibility for the Nullo flight passes to the Air Force Mission Controller. The Air Force Mission Controller will direct the drone radar controller to vector the fighter into visual contact with the drone and will be responsible for authorizing an attack when the optimum conditions exist for safety to ground personnel.

f. When drone operations are conducted at King I the Air Force Mission Controller will monitor the mission progress on the radar plotting boards at that station. If at any time the radar plot on the Nullo is lost or is about to be lost, the drone radar controller will immediately vector the fighter to the Nullo, using the last known position of the two aircraft. All missile launch operations are immediately ceased and the Air Force Mission Controller will then decide whether to continue with the mission, call a hold or cancel.

2. Operational procedure when limited armed escort fighters are available.

a. When only one armed escort fighter is in commission ready to go, it will be "spotted" ready for immediate scramble as near as possible to the end of the active runway which from the take off is to be initiated, during the period the Nullo drone is airborne. It will take off when cleared to scramble by the Air Force Mission Controller. It will normally remain on the ground as long as radio control of the drone is effective.

b. If there are more than one escort fighter in commission ready to go normal SOP will be followed regarding the use of armed escort for test missions, with the exception that care will be exercised in scheduling of fighters to retain at all times the capability for compliance with Paragraph 2a above.

3. Operational procedure when no armed escort are in commission.

a. When no armed escort fighters are in commission the decision to continue to conduct the test will be made at the discretion of the Air Force Mission Controller. If time permits this action will be clarified to HDT and DCS/Operations prior to the test.

4. Armed safety escort will be made available at the specific request of the Drone Squadron Commander when he feels it is required for safety.

5. Immediately prior to a hot missile launch the Air Force Mission Controller will decide whether or not the drone flight path meets safety and instrumentation criteria.

DCS/Operations Policy Guidance
Number 3

This decision will be based on advice from the drone radar controller, Flight Determination Laboratory (Operational Controller) and the Missile Flight Surveillance Office. A hold will be called by the Air Force Mission Controller if any of the three offices above advise that the tests cannot be satisfactorily run.

FOR THE COMMANDER:

OTTO R. HANEY
Colonel, USAF
DCS/Operations

APPENDIX E

Tenant and Bailed Aircraft at HADC. List prepared about 15 April 1957.

Note 1: Includes aircraft that are not technically bailed but "conditionally accepted" by the Air Force and in all ways treated as bailed.

Note 2: All F-101B aircraft listed under McDonnell Aircraft Corporation are among those "To come in FY 1958."

COPY

TENANT AND BAILED AIRCRAFT AT HADC

TENANT	TYPE	SN	
AFAC	F-102A	53-1807	
	F-102A	53-1818	
AFFTC	F-102A	-408	
	F-102A	-409	
CONVAIR	YF-102A	53-1788	BT
	F-102A	53-1793	BT
	F-102C	53-1797	BT
	YF-102C	53-1806	BT
HUGHES	B-25	43-86888	BT
	B-25	43-30648	BT
	B-25	43-30711	BT
	F-89D	51-408	BT
	F-89D	51-409	BT
	F-100D		BT
	F-102A	53-1799	BT
	* F-102A	56-995	BT
	B-57	53-1425	BT
LOCKHEED	JB-29J	44-86402	BT
	JB-29B	44-84073	BT
	JTB-50	44-290	BT
	JB-50D	44-068	BT
DOUGLAS	F-89D	53-2560	BT
	F-86	51-8282	BT
NORTHROP	JF-89J	53-2670	BT
	JB-57E	55-4245	BT
RADIO-PLANE	B-47B	51-2328	BT
	JB-47B	51-2350	BT
GOOD-YEAR	T-33	48-360	BT
	T-33	52-9374	BT
	T-33	52-9375	BT
	T-33	48-919	BT
BELL	B-47	53-2345	BT
	EYDB-47E	51-5219	BT
	EYDB-47E	51-5220	BT
	EDB-36H	51-5710	BT
	**EDB-36H	51-5706	BT
	F-80	45-8485	BT
	F-89	51-5814	BT

* To come in later
** To lose one B-36 soon

COPY

C O P Y

TENANT AND
BAILED AIRCRAFT AT HADC

TENANT	TYPE	SN
ARMY AVIATION BR	L-19	51-4624
		-4810
		-12143
		-12184
		-12220
		-12272
		-12275
		-12278
		-2160
	L-20	53-2785
		-2801
		54-1675
		-1695
	H-34	55-4495
		55-4496
	H-13	55-4624
		-4627
	H-19	53-3823

C O P Y

C O P Y

TENANT AND
BAILED AIRCRAFT AT HADC

TENANT	TYPE	SN	
MC DONNELL	F-101A	54-2436	BT
	F-101A	54-2427	BT
MC DONNELL	F-101B	56-233	BT
		56-234	BT
		56-236	BT
		56-241	BT
		56-243	BT

To come in FY 1958

56-251	KAFB	
56-252	Phase VI	AFFTC
56-253	Phase VI	AFFTC
56-254	Phase VI	AFFTC

C O P Y

APPENDIX F

A/C and Manpower Requirements by Project. List prepared about 1 March 1957.

3. 205C

F-84C	45	22	20	1.50	0.73	.66	7.50	3.66	3.33
F-100C	10	6	6	.30	0.27	.20	2.00	1.60	1.20
H-21B	25	12	10	.33	0.17	.17	1.11	0.53	.44
C-47	12	12	12	.06	0.60	.06	.60	0.60	.60
Sub Tot.	92	54	48	2.19	1.23	1.09	11.21	6.39	5.57

4. 217A

F-104A	16	10	16	.53	.33	.53	3.2	2.00	3.2
H-21B	9	8	5	.15	.11	.08	.4	0.34	.22
C-47	12	12	12	.06	.06	.06	.6	0.60	.6
B-26	5	5	5	.08	.08	.08	.33	0.33	.33
Sub Tot.	42	35	38	.79	.68	.75	4.53	3.27	4.35

5. MIKE MER. & ANX

F-84C	20	15	5	.66	.50	.16	3.33	2.50	.83
F-100A	30	30	30	1.67	1.00	1.00	10.00	6.00	6.00
F-100C	10	5	0	.30	.17	0	2.00	1.00	0.00
F-104A	11	10	0	.37	.33	0	2.20	2.00	0.00
B-26	42	42	42	.70	.70	.70	2.80	2.80	2.80
C-47	43	40	0	.72	.67	0	7.16	6.66	0.00
Sub Tot.	176	142	77	4.42	3.37	1.86	27.49	20.96	9.63

6. [illegible]

F-100A	22	20	20	.73	.66	.66	4.40	4.00	4.00
Sub Tot.	22	20	20	.73	.66	.66	4.40	4.00	4.00

7. 122A

F-100C	20	10	6	.66	.33	.20	4.00	2.00	1.20
H-21B	10	5	2	.16	.07	.03	.44	.22	.08
C-47	12	10	10	.06	.05	.05	.60	.50	.50
C-131B	8	0	0	.04	0	0	.22	0	0.00
R-47	10	0	0	.16	0	0	1.66	0	0.00
B-57	10	0	0	.16	0	0	1.00	0	0.00
Sub Tot.	70	25	18	1.24	0.45	.28	7.92	2.72	1.78

8. 221A

F-100A	54	5	5	1.80	.17	.16	10.80	1.00	1.00
F-100C	40	45	15	1.33	1.50	.50	8.00	9.00	3.00
F-100D	60	54	54	2.00	1.80	1.80	12.00	10.80	10.80
F-104A	30	30	0	1.00	1.00	0	6.00	6.00	0.00
L-20A	8	8	0	.11	.13	0	.10	.10	0.00
C-47	12	12	12	.07	.06	.07	.60	.60	.60
Sub Tot.	204	154	86	6.31	4.66	2.53	37.50	27.50	15.40

9. 302A

F-[illegible]	30	13	13	1.00	0.43	.43	5.00	2.16	2.16
F-100C	60	30	20	2.00	1.00	.33	12.00	6.00	4.00
H-21B	12	6	4	.20	.11	.07	.53	.34	.17
C-47	8	8	8	.04	.04	.04	.40	.40	.40
B-26	4	4	4	.07	.07	.07	.26	.26	.26
Sub Tot.	114	63	49	3.31	1.65	.91	18.19	9.16	6.99

10. 429A									
F-94C	40	20	17	1.33	.66	.57	6.67	3.33	2.83
F-100A	8	6	6	.26	.20	.20	1.60	1.20	1.20
F-100C	12	12	6	.40	.40	.20	2.66	1.40	1.23
H-21B	25	15	5	.42	.21	.08	1.11	.66	.22
C-47	12	12	12	.07	.06	.07	.60	.61	.60
B-26	60	60	60	1.00	1.00	1.00	4.00	4.00	4.00
Sub Tot.	157	125	106	3.48	2.53	2.12	16.64	12.20	10.08
11. 218A									
F-100C	74	37	28	2.47	1.23	.93	14.80	7.40	5.60
B-47	168	65	45	2.70	1.08	.75	28.00	10.83	7.50
Sub Tot.	242	102	73	5.17	2.31	1.68	42.80	18.23	13.10
12. ARMY VULN.									
T-29B	156	156	156	.87	.87	.87	4.33	4.33	4.33
B-50D	20	0	15	.38	0	.25	4.44	0	3.33
Sub Tot.	176	156	171	1.20	.87	1.12	8.77	4.33	7.66
13. AF VULN.									
C-131B	275	270	180	1.53	1.50	1.00	7.63	7.50	5.00
Sub Tot.	275	270	180	1.53	1.50	1.00	7.63	7.50	5.00
14. 2000									
F-94C	6	0	0	.10	.0	0	1.00	0	0.00
F-100C	12	12	8	.40	.40	.27	2.66	2.40	1.60
B-26	32	32	32	.53	.53	.53	2.13	2.13	2.13
Sub Tot.	50	44	40	1.03	.93	.80	5.79	4.53	3.73

15. WSSCA

C-131B	270	270	180	1.50	1.50	1.00	7.50	7.50	5.00
B-47	240	60	15	4.00	1.00	.08	40.00	10.00	2.50
Sub Tot.	510	330	195	5.50	2.50	1.08	47.50	17.50	7.50

16. RSD

F-94C	20	0	0	.66	0	0	3.33	0	0
F-100C	20	20	10	.66	.66	.33	4.00	4.00	2.00
L-20A	10	8	0	.13	.13	0	.13	.10	0
H-21B	10	10	3	.17	.10	.05	.44	.44	.13
C-47	12	12	12	.07	.06	.07	.60	.60	.60
B-26	40	40	40	.66	.67	.66	2.67	2.67	2.67
Sub Tot.	112	90	65	2.35	1.62	1.11	11.17	7.81	5.40

17. HAWK

F-94C	30	8	8	1.00	.27	.27	5.00	1.33	1.33
F-100C	30	20	5	1.00	.33	.17	6.00	4.00	1.00
Sub Tot.	60	28	13	2.00	.60	.44	11.00	5.33	2.33

18. 7051

F-94C	18	18	15	.60	.60	.50	3.00	3.00	2.50
Sub Tot.	18	18	15	.60	.60	.50	3.00	3.00	2.50

19. ALRCBEL-HI

L-20A	4	4	0	.05	.06	0	.06	.05	0
H-21B	4	4	0	.07	.05	0	.17	.17	0
Sub Tot.	8	8	0	.12	.11	0	.22	.22	0

20. 4261									
F-94C	7	5	4	.23	.17	.13	1.15	.83	.66
F-104A	6	10	3	.20	.33	.10	1.20	2.00	.60
H-21B	10	7	4	.17	.10	.07	.44	.31	.17
C-47	7	7	7	.04	.04	.04	.35	.35	.35
B-50	30	30	30	.50	.67	.50	6.66	6.66	6.66
SUB TOT.	60	59	48	1.14	1.31	.84	9.80	10.15	8.44
21. AERO-MED									
H-21B	10	10	10	.17	.10	.17	.44	.44	.44
C-47	30	100	30	.17	.55	.17	1.50	5.00	1.50
B-26	20	20	20	.33	.33	.33	1.33	1.33	1.33
SUB TOT.	60	130	60	.67	.98	.67	3.27	6.77	3.27
22. BALLOON									
L-20A	204	120	68	3.52	2.0	.91	3.52	1.60	.90
H-21B	71	42	42	1.18	.60	.70	3.15	1.73	1.86
C-47	326	256	326	1.81	1.42	1.81	16.30	12.80	16.30
B-26	45	45	45	.75	.75	.75	3.00	3.00	3.00
SUB TOT.	706	463	481	7.26	4.77	4.17	25.97	19.13	22.06
23. 4271									
F-94C	20	12	12	.66	.40	.40	3.33	1.60	1.60
T-33A	26	30	0	.19	.22	0	1.73	2.00	0
H-21B	10	25	20	.66	.36	.33	1.70	1.11	.88
C-47	7	7	7	.04	.04	.04	.35	.35	.35
B-57	26	0	0	.43	0	0	2.60	0	0
SUB TOT.	119	74	39	1.98	1.02	.77	9.71	5.06	2.83

24. BRONC CHASE

F-100A	20	50	20	1.00	1.66	.66	6.00	10.	4.00
F-100C	30	0	0	1.00	0	0	6.00	0	0
Sub Tot.	60	50	20	2.00	1.66	.66	12.00	10.	4.00

25. 6875

F-100C	15	7	3	.50	.23	.10	3.00	1.40	.60
Sub Tot.	15	7	3	.50	.23	.10	3.00	1.40	.60

26. 7659

C-47	18	18	18	.10	.09	.10	.90	.90	.90
Sub Tot.	18	18	18	.10	.09	.10	.90	.90	.90

27. 121A

F-94C	15	10	5	0.50	0.33	0.17	2.50	1.67	0.83
F-100C	10	8	5	0.33	0.27	0.17	2.00	1.60	1.00
H-21B	12	6	0	0.17	0.08	.08	0.53	0.27	0.00
C-47	10	6	6	0.05	0.03	0.03	0.50	0.30	0.30
B-26	5	5	5	0.08	0.08	0.08	0.33	0.33	0.33
Sub Tot.	52	35	21	1.13	0.79	0.53	5.86	4.17	2.46

28. 112A

F-94C	22	16	8	.73	.53	.27	3.65	2.67	1.33
C-47	7	5	5	.04	.02	.03	.35	0.25	.25
C-131B	40	0	0	.22	0	0	1.11	0	0
Sub Tot.	69	21	13	.99	0.55	.30	5.11	2.92	1.58

30. 107A									
C-47	10	10	10	.07	.05	.05	.60	.50	.50
SUB TOT.	10	10	10	.07	.05	.05	.60	.50	.50
30. 2710									
F-34C	16	0	8	.53	0	.27	2.66	0	1.33
F-100A	10	0	8	.33	0	.27	2.00	0	1.60
SUB TOT.	26	0	16	.86	0	.54	4.66	0	2.93
31. PROF. MAINT.									
F-34C	39	20	15	1.30	.66	.50	6.50	3.33	2.50
F-100A	20	20	15	.66	.66	.50	4.00	4.00	3.00
F-100C	48	38	18	1.60	1.27	.60	9.60	7.60	3.60
F-100D	6	6	6	.20	.20	.20	1.20	1.20	1.20
F-104A	3	10	0	.10	.33	0	.60	2.00	0
T-33A	27	27	27	.20	.20	.20	1.80	1.80	1.80
L-20A	20	20	7	.27	.33	.09	.26	.25	.09
H-21B	15	15	13	.25	.21	.22	.66	.66	.57
C-47	63	63	63	.35	.35	.35	3.15	3.15	3.15
VC-47	30	30	30	.20	.17	.20	.50	0.50	.50
T-29B	24	24	24	.13	.13	.13	.67	0.67	.67
B-26	67	67	67	1.12	1.12	1.12	4.46	4.46	4.46
B-47	0	20	0	0	.33	0	0	3.33	0
B-50	0	3	0	0	.06	0	0	.66	0
SUB TOT.	362	363	285	6.38	6.02	4.11	33.40	33.61	21.54

32. CRT & ADM

T-33A	243	243	243	1.80	1.80	1.80	16.20	16.20	16.20
H-21B	7	7	7	.12	0.10	.12	.31	.31	.31
C-47	170	170	170	.95	.94	.95	8.50	8.50	8.50
VC-47	150	150	150	1.00	.83	1.00	2.50	2.50	2.50
T-37	405	405	0	3.00	3.00	0	9.00	9.00	0
Sub Tot.	975	975	570	6.87	6.67	3.87	36.51	36.51	27.51

GRAND TOTAL

5287	2895	80.78	37.09	461.6	217.02

APPENDIX G

Ltr., Col. Richard C. Gibson, DCS/O, HADC, to Cmdr., ARDC, subj.: "Support Problems for B-57 Aircraft," 22 October 1956.

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HDOO 22 Oct 1956

SUBJECT: Support Problems for B-57 Aircraft

TO: Commander
Air Research and Development Command
Post Office Box 1395
Baltimore 3, Maryland

1. Although this Center has a valid requirement for a B-57B, C or E, this letter is submitted in explanation of why we declined the offer by your Headquarters (RDSTAP) of a RB-57A, and to reiterate the requirement for spaces, people and the airplane.

2. On 12 September 1956 this Center received a phone call from Mr. D. D. Morgan, (RDSTAP), offering HADC one RB-57A for test support. A prompt reply was requested. A negative reply was submitted in HADC TWX HDOO-9-14-E dated 12 September 1956 (See Inclosure Number 1). This refusal stated lack of maintenance people, and the requirements for a B-57B, C or E were reiterated.

3. In November of 1954 HADC requested a B-57B aircraft to support test projects at Holloman. On 4 October 1955 HADC's Projected Aircraft Inventory, Reports Control Symbol 2-ARDC, reflected the requirements for B-57 aircraft. In a letter to HQ ARDC, Subject: Manpower Authorization Request for Change, dated 14 November 1955, HADC requested manpower to maintain the B-57 aircraft reflected in the projected aircraft inventory (See Inclosure Number 2). Since that time no spaces have been authorized for B-57 aircraft nor have any people been assigned. On 10 April 1956 the HADC Two and One-Half Year Aircraft Requirements Forecast again requested B-57 aircraft. The manpower requirements for these new aircraft which are needed to meet HADC requirements were not the only planning attempted by HADC to attain a position whereby a B-57B could be maintained. In August 1956 HADC submitted to your Headquarters a TWX, HDOO-8-25-E (See Inclosure Number 3), requesting the serial numbers of any B-57B aircraft to be provided Holloman in order that logistic support people could requisition Table Two equipment for the aircraft. We assumed that this was a valid request since we had for eighteen (18) months requested a B-57B, and this B-57B was reflected in the HQ ARDC FY-57-2 as programmed for HADC in first

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quarter Fiscal Year 1957. In reply to this TWX we received from your Headquarters a TWX RDSTAP-8-1149-3 (See Inclosure Number 4) which stated that although a B-57B was in the PF-57-2, this did not necessarily mean that a B-57 would be assigned to Holloman.

4. Latest documents available to this Center indicate that only sixty RB-57A's are in the USAF inventory. Forty of these are overseas and only four are in the ARDC Command. In view of our present personnel deficiencies in the maintenance area, and in anticipation of difficulty in the logistics area, it is believed that an RB-57A would be most unsatisfactory for this Center.

5. Again we would like to reiterate a valid requirement for a B-57B, C or E for use on high altitude recovery system tests, high altitude parachute target drops, tracking missions for the Army, Navy and missile systems, and for carrying engineer observers on safety chase. Following are some of the projects which require the B-57B, C or E aircraft:

HADC Recovery Systems Branch	Hrs/Qtr
HADC Recovery Systems Branch	30
1795 - High Altitude Para Drops	10
201A (F-102) High Altitude Para Drops	10
208A (Falcon) High Altitude Para Drops	20
2129 (F-101B High Altitude Para Drops	10
Talos (NCMTF WSPG) High Altitude Para Drops	15
Nike - Tracking	15
Total	110

A total of 95 hours per quarter is indicated for high altitude para drop missions alone. An additional requirement for B-57B, C or E (tandem seat configuration) for photo and safety chase and tracking missions will add approximately 15 hours to the above figure for a grand total of 110 hours per quarter. This indicates a requirement for a minimum of three (3) B-57B, C or E aircraft for this Center by the third quarter of Fiscal Year 1957.

6. An example of the dire need for such an aircraft is attested by the fact that since 15 July 1956, the Navy Talos project has requested 34 missions, 26 of which were turned down by HADC Range Scheduling Office for non-availability of an aircraft capable of dropping a target parachute at the required altitude. Of the eight (8) missions scheduled, seven (7) were cancelled because of scheduled support aircraft being AOCP. One mission of the thirty-four (34) went as requested. Further

HQ HADC HDOO SUBJ: Support Problems for B-57 Aircraft

lack of suitable drop aircraft could cause a costly delay to the Talos program.

7. Although the requirement for B-57 aircraft is urgently needed, we cannot accept these aircraft without additional authorizations for spaces and personnel to man these spaces. Space requests, based on the Two and One-Half Year Aircraft Requirements Forecast, have been submitted.

FOR THE COMMANDER:

RICHARD C. GIBSON
Colonel, USAF
DCS/Operations

4 Incls
1. TWX HDOO-9-14-E
2. Manpower Auth Req for Change
3. TWX HDOO-8-25-E
4. TWX RDSTAP-8-149-3

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ADJ 56-6489

APPENDIX H

Flight Test Division Standard Operating Procedure Number 25, versions as of 19 December 1956 and 17 May 1957.

COPY

STANDARD OPERATING PROCEDURE NUMBER 25 } FLIGHT TEST DIVISION, 6580TH AIR BASE GROUP, Holloman Air Force Base, New Mexico 19 December 1956

IFR Mission Flights

1. Purpose and Scope. The purpose of this Standard Operating Procedure is to outline the requirements and define weather conditions which will permit mission support aircraft to fly when instrument conditions prevail and the mission requires flying over an overcast. This Standard Operating Procedure pertains to all pilots who are cleared to fly test support missions. Section Chiefs will be responsible to monitor compliance with the requirements outlined in this Directive.

2. Requirements:

a. Test support missions will not be flown above an overcast when a VFR climbout and letdown is not possible.

b. Test support missions will not be flown if the overcast condition is below 10,000 feet MSL.

c. Test support missions will not be flown when the overcast is in excess of 3,000 feet thick.

d. Test support missions will not be conducted closer than 1,000 feet to the cloud formation.

e. Test support missions flown over an overcast require the accomplishment of AF Form 175.

f. During test support missions conducted over an overcast, the ARN-6 radio will be on and tuned to the Holloman homer (221 kc) and the selector placed in the COMPASS position.

OAKLEY W. BARON
Lt Colonel, USAF
Director, Flight Test Division

COPY

DIRECTORATE OF AIRCRAFT MISSILE TEST
AND FLIGHT TEST DIVISION
HOLLOMAN AIR DEVELOPMENT CENTER
United States Air Force
Holloman Air Force Base, New Mexico

DIRECTORATE SOP

17 May 1957

NUMBER ----- 36

FLIGHT TEST SOP

NUMBER ----- 25

IFR MISSION FLIGHTS

1. Purpose: The purpose of this Standard Operating Procedure is to outline the requirements and define weather conditions which will permit mission support aircraft to fly when instrument conditions prevail and the mission requires flying over an overcast.

2. Scope: This Standard Operating Procedure pertains to all pilots who are cleared to fly test support missions. Section Chiefs will be responsible to monitor compliance with the requirements outlined in this Directive.

3. Requirements:

a. Test support missions will not be conducted in an overcast.

b. Test support missions will not be flown when the overcast is below 7000 feet MSL, and visibility is less then 2 miles.

c. Test support missions will not be conducted closer than 1000 feet to the cloud formation.

d. Drones or other remote-controlled vehicles will not be chased by test support aircraft through cloud formations.

e. Test support missions flown over an overcast require the accomplishment of AF Form 175 and the remark included, "Will avoid all control zones and airways."

f. IFR climb-outs will be made from the Holloman radio beacon (221 KCS) on a heading of 350 degrees. Aircraft will remain on tower frequency during climb-out and advise when in the clear. IFR descents will be on approval by Holloman Tower and in accordance with the published let-down chart.

g. No test will be conducted under IFR conditions when any other test is still in progress. No test will be started when another test is being run under IFR conditions. Control of these factors will be exercised by Mission Control, so that no possible collision conditions can exist on-range between test operations and IFR climb-outs and let-downs.

HDT Subject: Directorate SOP #36, Flight Test SOP #25.

h. During test support mission conducted over an overcast the ARN-6 radio will be tuned to the Holloman radio beacon and the selector placed in the Compass position.

i. Fuel minimums for jet aircraft for IFR mission completion will be 2000 pounds.

4. Exceptions:

a. WSSCA, ECM, and other missions involving the use of C-131 or T-29 type aircraft may be conducted in or above an overcast. Minimum flight altitude for such missions will be 14,000 feet MSL and weather minimums will be 5000 feet MSL and 2 miles visibility.

b. Tracking missions may be conducted in or above an overcast. Minimum flight altitude for such missions will be 14,000 feet MSL and weather minimums will be:

(1) Conventional - 5000 feet MSL, visibility 2 miles.

(2) Jet - 6000 feet MSL, visibility 2 miles.

A W Kinney, Major

for L. BAKER
Colonel, USAF
Director of Aircraft Missile Test

O W Baron

OAKLEY W. BARON
Lt Colonel, USAF
Director, Flight Test Division

APPENDIX I

DCS/Operations Policy Statement Number 4, 13 September 1955.

DCS/OPERATIONS
HOLLOMAN AIR DEVELOPMENT CENTER
Holloman Air Force Base
New Mexico

DCS/OPERATIONS POLICY
STATEMENT NUMBER 4

13 SEPTEMBER 1955

RESTRICTION ON USE OF C-131B'S

1. Until further notice the C-131B aircraft are not to be flown to bases other than ARDC Centers. Exceptions to this policy will be made only when transporting VIP's or when approved by DCS/Operations.

2. This policy statement is a result of ARDC message RDTO-8-6-E dated 24 August 1955 concerning criticism received at ARDC for the indiscriminate use of test bed C-131B's.

Clarence L. Elder
CLARENCE L. ELDER
Colonel, USAF
DCS/Operations

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HDL 8 Copies

APPENDIX J

Manpower Requirements for Aircraft Maintenance. Memo from Manpower & Organization Division, September 1956.

C O P Y

MANPOWER REQUIREMENTS FOR AIRCRAFT MAINTENANCE

1. Following are examples of requests from HADC for additional manpower for the aircraft maintenance function which were submitted to Headquarters ARDC during CY1955 and 56:

Date Requested	No. and Type Requested	Action by ARDC
1 Apr 1955	18 Airman Spaces	None
1 May 1955	8 Airman Spaces	None
12 Jul 1955	12 Airman Spaces	None
14 Nov 1955	23 Airman Spaces 26 Civilian Spaces	None
30 Nov 1955	27 Military or Civilian	None (Sidewinder)
2 Feb 1956	16 Airman Spaces	None
26 Jul 1956	7 Airman Spaces 106 Civilian Spaces	Received 90 Spaces on 1 Oct 1956

2. In September 1955, the ARDC Manpower Management Review Team recommended an increase of 13 spaces for the aircraft maintenance function. To date, ARDC has been unable to provide any of these additional spaces for HADC. At this time, military AFSC's were removed from the manning document and civilians were substituted under project "Home Front". Sufficient civilians qualified in aircraft maintenance work could not be hired in this area and Headquarters USAF would not allow us to reprogram military spaces back in to project "Home Front" AFSC's.

3. In July 1956, we re-evaluated our total manning requirements for the aircraft maintenance function based on ARDC manning criteria by type and number of aircraft assigned. As of 1 September 1956 we require a total of 586 spaces; as of this date, we are authorized a total of 487 spaces. A deficit of 99 spaces still exists after the addition of the 90 spaces received on 1 October 1956.

4. In our FY 57 Manpower Program we included a total of 86 spaces for the aircraft maintenance function. In FY 58 Budget Estimate we indicated that we needed 109 additional spaces in the first quarter of FY 57.

5. The aircraft inventory has increased from 35 HADC assigned aircraft in January 1955 to a projected inventory of 62 assigned aircraft in July 1957.

C O P Y

APPENDIX K

Citation to Accompany the Award of the Commendation Ribbon to William F. Haizlip.

Citation to Accompany the Award
of the
Commendation Ribbon
to
William F. Haizlip

Lieutenant Colonel William F. Haizlip whose primary duty was and still is the Inspector General for Holloman Air Development Center was assigned the additional duty as Commander of the 6580th Field Maintenance Squadron on 1 September 1956. Assignment was necessitated by the fact that the deplorable condition of aircraft maintenance was adversely effecting the overall mission of Holloman Air Development Center. Colonel Haizlip distinguished himself by meritorious service as Commander of the 6580th Field Maintenance Squadron 1 September 1956 to 2 January 1957.

"In commission-time" is the criteria used in evaluating the performance of an aircraft maintenance squadron. The average standard percentage of "in-commission-time" is 50%. By managerial improvements the "in-commission-time" for aircraft assigned to HADC went from 34.8% in August 1956 to 62.1% in December 1956.

Managerial improvements initiated by Colonel Haizlip were:

a. Eliminated duplication and overlap of authority in the Maintenance Control Unit, Production Control Unit and Quality Control Unit by organizing a single Production Control Section under the direct supervision of the Maintenance Control Officer.

b. Improved employee relations by establishing a "line-of-command" whereby all employees are responsible to one individual.

c. Reduced aircraft inspection time from an average of 10 to 12 working days to an average of 5 to 6 working days.

d. Effected savings of 50 to 75 manhours per day by having a PBX switchboard, necessary additional telephones and an intercommunication system installed. This communications system linked Base Supply, Base Operations, various aircraft maintenance shops and Maintenance Control into one efficient operation whose primary effort was to improve "in-commission-time".

Lieutenant Colonel William F. Haizlip's extreme conscientiousness and devotion to duty reflects great credit to himself and to the Air Force.

APPENDIX L

General Comments on the [Holloman] Flying Safety Program, by Maj. Raymond C. Latham, Chief, Flying Safety Branch, Hq., ARDC, May 1956.

General Comments on the Flying Safety Program

1. The Flying Savety Officer is located organizationally under the Commander of the Air Base Group. He is physically located in Base Operations and is under the operational control of the Chief of the Flight Test Division. As such, he does not have direct access to either the Base or Center Commander.

2. A Flying Safety Council, as required by ARDCR 62-10, has not been established. It is believed such a council would be a definite asset to the center program. This would permit the F/S officer to present the problem directly to the action agency. These councils have been valuable to other centers.

3. From talking to various pilots, the emphasis on the Flying Safety Program seems to be in the wrong direction. An attitude of general fear of retribution seems to prevail. This creates a very unhealthy situation. Personnel assigned in the operations are all sincere and are doing an excellent job with the equipment available, yet, in the past this quality performance seems to have gone unnoticed and the unfortunate happenings exploited.

4. The training program is adequate, although it is hampered by lack of equipment and personnel and must be sandwiched in whenever the mission permits. A jet upgrading program is being pursued but satisfactory results will take time. With the increasing number of 100 series aircraft due to arrive, this program will have to be stepped up. The time requirements for upgrading are in line with others in the command.

5. Recently a rash of blown tire and parachute failures have been experienced. As a combative measure, a policy has been established that all landings by jet aircraft (except in an emergency) are made on the 12,000 foot runway. In addition, a more thorough investigation should have been made to determine the cause. This will be done by the Flying Safety Officer.

6. In line with the above, it appears that maintenance standards are below par. This is probably due to a critical shortage of qualified personnel and supervisors (no maintenance officer since Jan.). Examples - the generator and the F-86 fuel gauge.

7. The airfield itself shows a lack of preventative maintenance. numerous holes and cracks are evident in the shoulders. It is difficult to tell what is runway and what is overrun on 21L. Ramp area was cluttered with all types of equipment. The holes made by the F-102 undershoot in Jan. still not filled.

8. Tower has little or no control of vehicles operating on the airfield. Alert jeeps are not radio equipped and communications with crash

and rescue equipment is through the fire station. Equipment is on order. Due to the large number of vehicles on the airdrome, this equipment should get priority.

9. The Personal Equipment setup is still not adequate, however personnel concerned are well aware of the fact and making every effort to correct the situation. It was also noted that of five authorized positions in this section, two were filled by Category 4 airmen.

10. No evidence could be found that recommendations made as a result of accident investigations were followed. Notably the recommendation following the F-89 accident in June of 1955 as to the wearing of clothing during flying operations. No procedures or policies could be found in writing and spot check of pilots did not indicate compliance in another recommendation as a result of the F-94 in December are not being followed.

Recommendations

1. That the Flight Safety Officer be placed organizationally and operationally under the Deputy for Operations.

2. That a Flight Safety Council beaappointed and the importance of this Council emphasized.

3. That the existing attitude toward Flying Safety be aligned with the command policy i.e., the mission will not be compromised for the sake of Flying Safety, but our task is to perform the mission in the safest possible manner. Our pilots are professionals and above average pilots. They should be impressed with this and recognized for a job well done. This should also be emphasized to all personnel connected with aircraft operation. Play up the positive contribution to Flight Safety and play down the negative side.

4. A more thorough investigation made and remedial action taken regarding the tire situation. This also applies to any other accident potential. Records seem to indicate this particular problem arose in August of 1955 and has been allowed to continue without too much action.

5. Assign a maintenance officer as soon as possible and increase the supervision of this activity.

6. Increase the preventative maintenance on the airdrome.

7. Continue action to improve the Personal Equipment setup.

8. Insure that recommendation regarding safety of flight items are not ignored or allowed to die.

9. Publicize the well done type flying here.

Suggestions - A column and pictures in the local paper. Submit order well done award system. Tell the story at Flying Safety Meetings. Give an award for well done (cigarette lighter, key case, etc.).